APPENDIX D

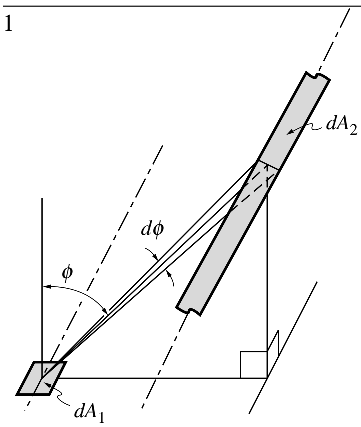
VIEW FACTOR CATALOGUE

In this appendix a small number of view factor relations and figures are presented. A much larger collection from a variety of references has been compiled by Howell [1, 2], from which the present list has been extracted. The latest edition of this collection can be accessed on the Internet via `http://www.engr.uky.edu/rtl/Catalog/`. View factors for all configurations given in this appendix, as well as those between two arbitrarily orientated rectangular plates lying in perpendicular planes, as given by equations (4.41) and (4.42), can be calculated with the stand-alone program `viewfactors` (prompting for user input) or from within another program through calls to Fortran function `view`, both given in Appendix F. A number of commercial and noncommercial computer programs are available for the evaluation of more complicated view factors [3–13]. A list of papers and monographs that either deal with evaluation methods for view factors, or present results for specified configurations (ordered by date of publication) is also given. No attempt at completeness has been made.

Note: In all expressions in which inverse trigonometric functions appear, the principal value is to be taken; i.e., for any argument ξ,

$$-\frac{\pi}{2} \le \sin^{-1}\xi \le +\frac{\pi}{2}; \quad 0 \le \cos^{-1}\xi \le \pi; \quad -\frac{\pi}{2} \le \tan^{-1}\xi \le +\frac{\pi}{2}.$$

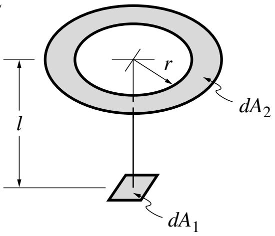
1



Differential strip element of any length z to infinitely long strip of differential width on parallel line; plane containing element does not intercept strip

$$dF_{d1-d2} = \frac{\cos\phi \, d\phi}{2}$$

2

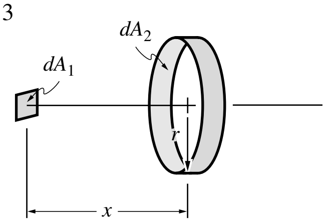


Differential planar element to differential coaxial ring parallel to the element

$$R = r/l$$

$$dF_{d1-d2} = \frac{2R}{(1+R^2)^2}\,dR$$

3

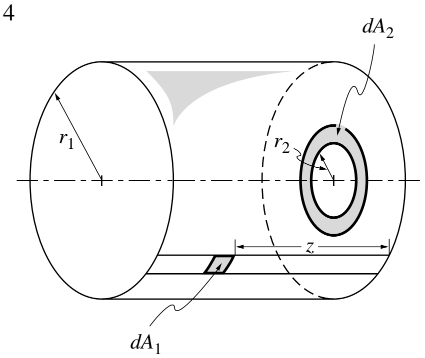


Differential planar element on and normal to ring axis to inside of differential ring

$$X = x/r$$

$$dF_{d1-d2} = \frac{2X}{(X^2+1)^2}\,dX$$

4

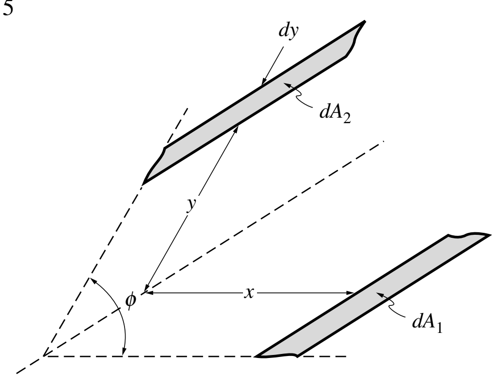


Element on surface of right-circular cylinder to coaxial differential ring on cylinder base, $r_2 < r_1$

$$Z = z/r_1, \quad R = r_2/r_1$$
$$X = 1 + Z^2 + R^2$$

$$dF_{d1-d2} = \frac{2Z(X - 2R^2)R\,dR}{(X^2 - 4R^2)^{3/2}}$$

5

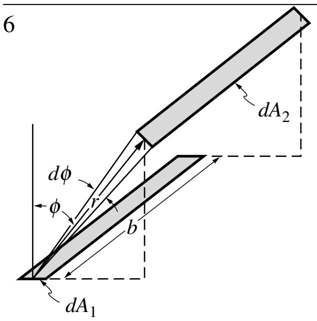


Parallel differential strip elements in intersecting planes

$$Y = y/x$$

$$dF_{d1-d2} = \frac{Y\sin^2\phi\,dY}{2(1+Y^2-2Y\cos\phi)^{3/2}}$$

6

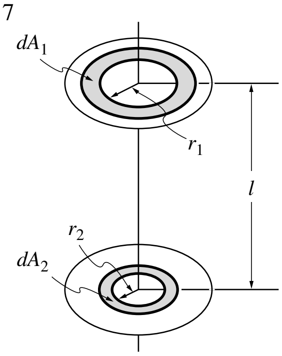


Strip of finite length b and of differential width, to differential strip of same length on parallel generating line

$$B = b/r$$

$$dF_{d1-d2} = \tan^{-1} B\,\frac{\cos\phi}{\pi}\,d\phi$$

7

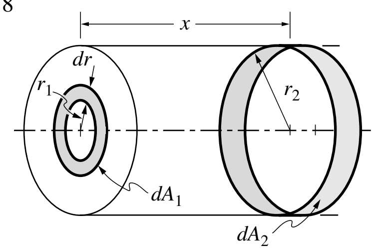


Differential ring element to ring element on coaxial disk

$$R = r_2/r_1, \quad L = l/r_1$$

$$dF_{d1-d2} = \frac{2RL^2[L^2 + R^2 + 1]\,dR}{[(L^2 + R^2 + 1)^2 - 4R^2]^{3/2}}$$

8

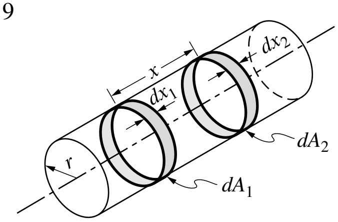


Ring element on base to circumferential ring element on interior of right-circular cylinder

$$X = x/r_2, \quad R = r_1/r_2$$

$$dF_{d1-d2} = \frac{2X(X^2 - R^2 + 1)\,dX}{[(X^2 + R^2 + 1)^2 - 4R^2]^{3/2}}$$

9

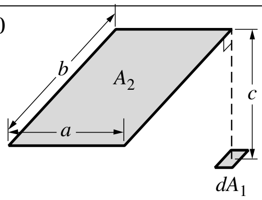


Two ring elements on the interior of right-circular cylinder

$$X = x/2r$$

$$dF_{d1-d2} = \left[1 - \frac{X(2X^2 + 3)}{2(X^2 + 1)^{3/2}}\right] dX_2$$

10

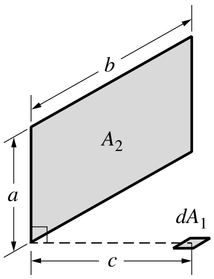


Differential planar element to finite parallel rectangle; normal to element passes through corner of rectangle

$$A = a/c, \quad B = b/c$$

$$F_{d1-2} = \frac{1}{2\pi}\left\{\frac{A}{\sqrt{1+A^2}}\tan^{-1}\frac{B}{\sqrt{1+A^2}} + \frac{B}{\sqrt{1+B^2}}\tan^{-1}\frac{A}{\sqrt{1+B^2}}\right\}$$

11

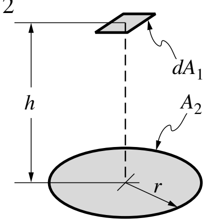


Differential planar element to rectangle in plane 90° to plane of element

$$X = a/b, \quad Y = c/b$$

$$F_{d1-2} = \frac{1}{2\pi}\left(\tan^{-1}\frac{1}{Y} - \frac{Y}{\sqrt{X^2 + Y^2}}\tan^{-1}\frac{1}{\sqrt{X^2 + Y^2}}\right)$$

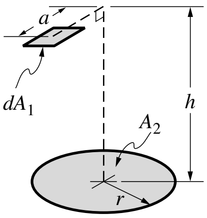
12



Differential planar element to circular disk in plane parallel to element; normal to element passes through center of disk

$$H = h/r$$

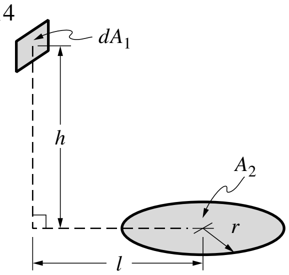
$$F_{d1-2} = \frac{1}{H^2 + 1}$$

13 

Differential planar element to circular disk in plane parallel to element

$$H = h/a, \quad R = r/a$$
$$Z = 1 + H^2 + R^2$$
$$F_{d1-2} = \frac{1}{2}\left[1 - \frac{Z - 2R^2}{\sqrt{Z^2 - 4R^2}}\right]$$

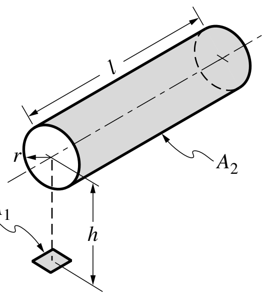
---

14 

Differential planar element to circular disk; planes containing element and disk intersect at 90°; $l \geq r$

$$H = h/l, \quad R = r/l$$
$$Z = 1 + H^2 + R^2$$
$$F_{d1-2} = \frac{H}{2}\left[\frac{Z}{\sqrt{Z^2 - 4R^2}} - 1\right]$$

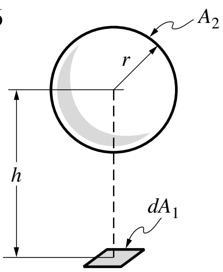
---

15 

Differential planar element to right-circular cylinder of finite length and radius; normal to element passes through one end of cylinder and is perpendicular to cylinder axis

$$L = l/r, \quad H = h/r$$
$$X = (1 + H)^2 + L^2$$
$$Y = (1 - H)^2 + L^2$$
$$F_{d1-2} = \frac{L}{\pi H}\left[\frac{1}{L}\tan^{-1}\frac{L}{\sqrt{H^2-1}} + \frac{X-2H}{\sqrt{XY}}\tan^{-1}\sqrt{\frac{X(H-1)}{Y(H+1)}} - \tan^{-1}\sqrt{\frac{H-1}{H+1}}\right]$$

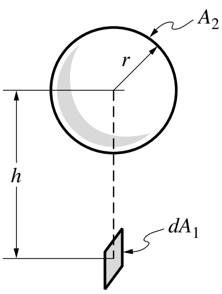
---

16 

Differential planar element to sphere; normal to center of element passes through center of sphere

$$F_{d1-2} = \left(\frac{r}{h}\right)^2$$

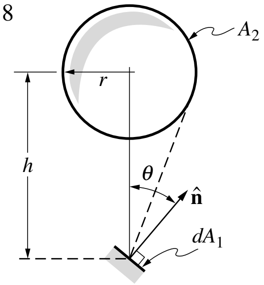
---

17 

Differential planar element to sphere; tangent to element passes through center of sphere

$$H = h/r$$
$$F_{d1-2} = \frac{1}{\pi}\left[\tan^{-1}\frac{1}{\sqrt{H^2-1}} - \frac{\sqrt{H^2-1}}{H^2}\right]$$

18

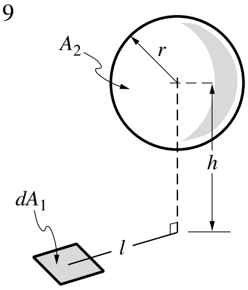


Differential planar element to sphere; element plane does not intersect sphere

$$\theta \le \cos^{-1}\frac{r}{h}$$

$$F_{d1-2} = \left(\frac{r}{h}\right)^2 \cos\theta$$

19



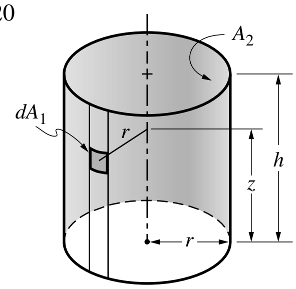
Differential planar element to sphere

$$L = l/r, \quad H = h/r$$

$$H \ge 1: \quad F_{d1-2} = \frac{H}{(L^2 + H^2)^{3/2}}$$

$$-1 < H < 1: \quad F_{d1-2} = \frac{1}{\pi}\left\{\frac{H}{(L^2+H^2)^{3/2}}\cos^{-1}\frac{-H}{L\sqrt{L^2+H^2-1}} - \frac{\sqrt{(L^2+H^2-1)(1-H^2)}}{L^2+H^2} - \sin^{-1}\frac{\sqrt{H^2+L^2-1}}{L^2} + \frac{\pi}{2}\right\}$$

20

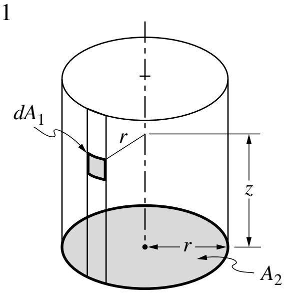


Differential element on longitudinal strip inside cylinder to inside cylinder surface

$$Z = z/2r, \quad H = h/2r$$

$$F_{d1-2} = 1 + H - \frac{Z^2 + \frac{1}{2}}{\sqrt{Z^2+1}} - \frac{(H-Z)^2 + \frac{1}{2}}{\sqrt{(H-Z)^2+1}}$$

21

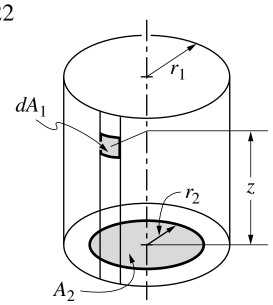


Differential element on longitudinal strip on inside of right-circular cylinder to base of cylinder

$$Z = z/r$$

$$F_{d1-2} = \frac{Z^2+2}{2\sqrt{Z^2+4}} - \frac{Z}{2}$$

22



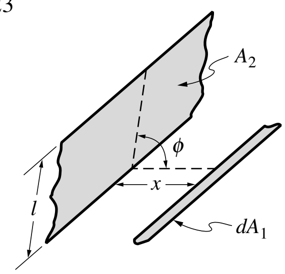
Differential element on surface of right-circular cylinder to disk on base of cylinder, $r_2 < r_1$ (see Configuration 13)

$$Z = z/r_1, \quad R = r_2/r_1$$

$$X = 1 + Z^2 + R^2$$

$$F_{d1-2} = \frac{Z}{2}\left\{\frac{X}{\sqrt{X^2 - 4R^2}} - 1\right\}$$

23

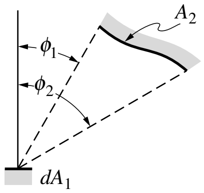


Infinite differential strip to parallel infinite plane of finite width; plane and plane containing strip intersect at arbitrary angle ϕ

$$X = x/l$$

$$F_{d1-2} = \frac{1}{2} + \frac{\cos\phi - X}{2\sqrt{1 + X^2 - 2X\cos\phi}}$$

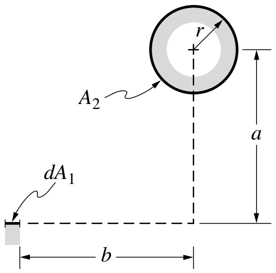
24



Differential strip element of any length to an infinitely long strip of finite width; cross-section of A_2 is arbitrary (but does not vary perpendicular to the paper); plane of dA_1 does not intersect A_2

$$F_{d1-2} = \tfrac{1}{2}(\sin\phi_2 - \sin\phi_1)$$

25

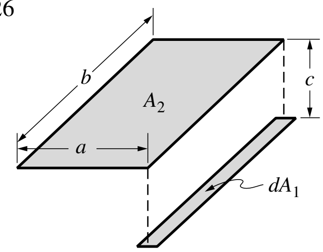


Differential strip element of any length to infinitely long parallel cylinder; $r < a$

$$A = a/r, \quad B = b/r$$

$$F_{d1-2} = \frac{A}{A^2 + B^2}$$

26

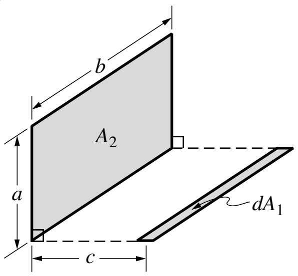


Differential strip element to rectangle in plane parallel to strip; strip is opposite one edge of rectangle

$$X = a/c, \quad Y = b/c$$

$$F_{d1-2} = \frac{1}{\pi Y}\left(\sqrt{1+Y^2}\tan^{-1}\frac{X}{\sqrt{1+Y^2}} - \tan^{-1}X + \frac{XY}{\sqrt{1+X^2}}\tan^{-1}\frac{Y}{\sqrt{1+X^2}}\right)$$

27

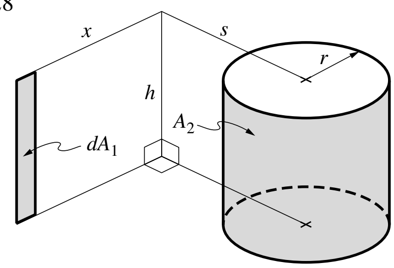


Differential strip element to rectangle in plane 90° to plane of strip

$$X = a/b, \quad Y = c/b$$

$$F_{d1-2} = \frac{1}{\pi}\left[\tan^{-1}\frac{1}{Y} + \frac{Y}{2}\ln\frac{Y^2(X^2+Y^2+1)}{(Y^2+1)(X^2+Y^2)} - \frac{Y}{\sqrt{X^2+Y^2}}\tan^{-1}\frac{1}{\sqrt{X^2+Y^2}}\right]$$

28



Differential strip element to exterior of right-circular cylinder of finite length; strip and cylinder are parallel and of equal length; plane containing strip does not intersect cylinder

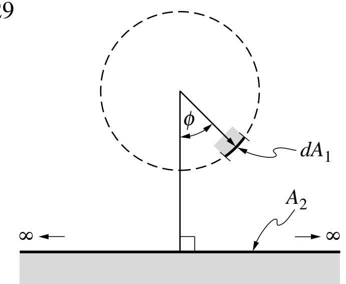
$$S = s/r, \quad X = x/r, \quad H = h/r$$

$$A = H^2 + S^2 + X^2 - 1$$

$$B = H^2 - S^2 - X^2 + 1$$

$$F_{d1-2} = \frac{S}{S^2 + X^2}\left(1 - \frac{1}{\pi}\left[\cos^{-1}\frac{B}{A} - \frac{\sqrt{A^2 + 4H^2}}{2H}\cos^{-1}\frac{B}{A\sqrt{S^2 + X^2}} - \frac{B}{2H}\sin^{-1}\frac{1}{\sqrt{S^2 + X^2}}\right] - \frac{A}{4H}\right)$$

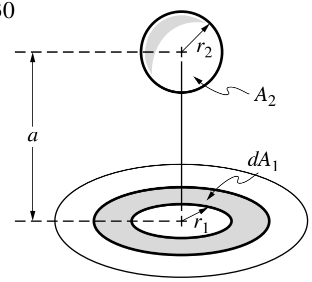
29



Differential strip element of any length on exterior of cylinder to plane of infinite length and width

$$F_{d1-2} = \tfrac{1}{2}(1 + \cos\phi)$$

30

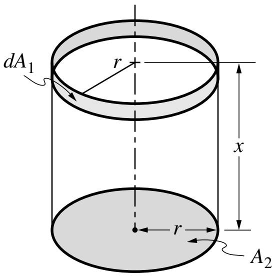


Differential ring element on surface of disk to coaxial sphere

$$R_1 = r_1/a, \quad R_2 = r_2/a$$

$$F_{d1-2} = \frac{R_2^2}{\left(1 + R_1^2\right)^{3/2}}$$

31

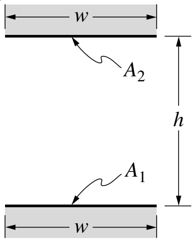


Differential ring element on interior of right-circular cylinder to circular disk at end of cylinder

$$X = x/2r$$

$$F_{d1-2} = \frac{X^2 + \frac{1}{2}}{\sqrt{X^2 + 1}} - X$$

32

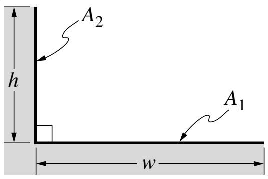


Two infinitely long, directly opposed parallel plates of the same finite width

$$H = h/w$$

$$F_{1-2} = F_{2-1} = \sqrt{1 + H^2} - H$$

33

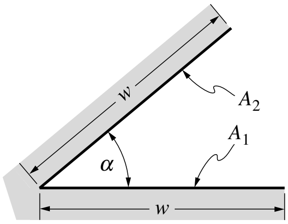


Two infinitely long plates of unequal widths h and w, having one common edge, and at an angle of 90° to each other

$$H = h/w$$

$$F_{1-2} = \frac{1}{2}\left(1 + H - \sqrt{1 + H^2}\right)$$

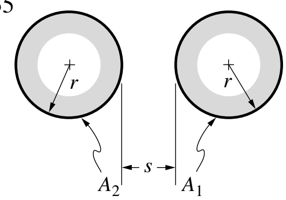
34



Two infinitely long plates of equal finite width w, having one common edge, forming a wedge-like groove with opening angle α

$$F_{1-2} = F_{2-1} = 1 - \sin\frac{\alpha}{2}$$

35

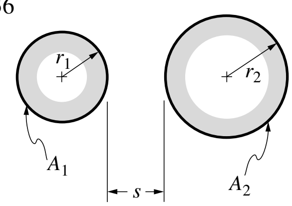


Infinitely long parallel cylinders of the same diameter

$$X = 1 + \frac{s}{2r}$$

$$F_{1-2} = \frac{1}{\pi}\left(\sin^{-1}\frac{1}{X} + \sqrt{X^2 - 1} - X\right)$$

36



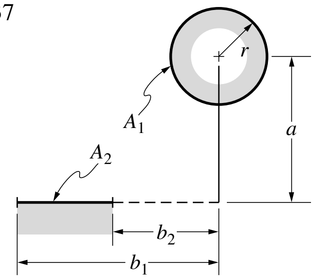
Two infinite parallel cylinders of different radius

$$R = r_2/r_1, \quad S = s/r_1,$$

$$C = 1 + R + S$$

$$F_{1-2} = \frac{1}{2\pi}\left\{\pi + \sqrt{C^2 - (R+1)^2} - \sqrt{C^2 - (R-1)^2} + (R-1)\cos^{-1}\frac{R-1}{C} - (R+1)\cos^{-1}\frac{R+1}{C}\right\}$$

37

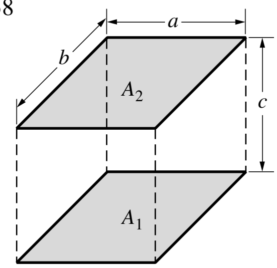


Exterior of infinitely long cylinder to unsymmetrically placed, infinitely long parallel rectangle; $r \leq a$

$$B_1 = b_1/a, \quad B_2 = b_2/a$$

$$F_{1-2} = \frac{1}{2\pi}\left(\tan^{-1} B_1 - \tan^{-1} B_2\right)$$

38

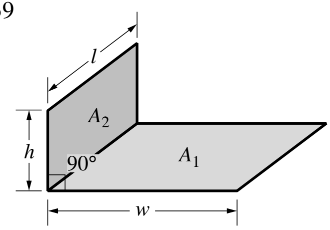


Identical, parallel, directly opposed rectangles

$$X = a/c, \quad Y = b/c$$

$$F_{1-2} = \frac{2}{\pi XY}\left\{\ln\left[\frac{(1+X^2)(1+Y^2)}{1+X^2+Y^2}\right]^{1/2} + X\sqrt{1+Y^2}\tan^{-1}\frac{X}{\sqrt{1+Y^2}} + Y\sqrt{1+X^2}\tan^{-1}\frac{Y}{\sqrt{1+X^2}} - X\tan^{-1}X - Y\tan^{-1}Y\right\}$$

39

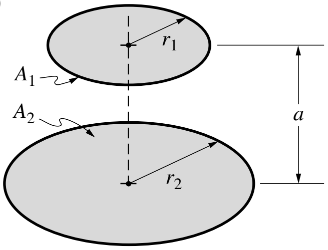


Two finite rectangles of same length, having one common edge, and at an angle of 90° to each other

$$H = h/l, \quad W = w/l$$

$$F_{1-2} = \frac{1}{\pi W}\left(W \tan^{-1}\frac{1}{W} + H \tan^{-1}\frac{1}{H} - \sqrt{H^2 + W^2}\tan^{-1}\frac{1}{\sqrt{H^2 + W^2}} + \frac{1}{4}\ln\left\{ \frac{(1+W^2)(1+H^2)}{1+W^2+H^2}\left[\frac{W^2(1+W^2+H^2)}{(1+W^2)(W^2+H^2)}\right]^{W^2}\left[\frac{H^2(1+H^2+W^2)}{(1+H^2)(H^2+W^2)}\right]^{H^2}\right\}\right)$$

40



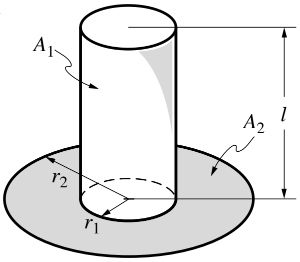
Disk to parallel coaxial disk of unequal radius

$$R_1 = r_1/a, \quad R_2 = r_2/a$$

$$X = 1 + \frac{1 + R_2^2}{R_1^2}$$

$$F_{1-2} = \frac{1}{2}\left\{ X - \sqrt{X^2 - 4\left(\frac{R_2}{R_1}\right)^2} \right\}$$

41



Outer surface of cylinder to annular disk at end of cylinder

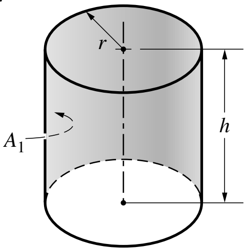
$$R = r_1/r_2, \quad L = l/r_2$$

$$A = L^2 + R^2 - 1$$

$$B = L^2 - R^2 + 1$$

$$F_{1-2} = \frac{B}{8RL} + \frac{1}{2\pi}\left[\cos^{-1}\frac{A}{B} - \frac{1}{2L}\sqrt{\frac{(A+2)^2}{R^2} - 4}\,\cos^{-1}\frac{AR}{B} - \frac{A}{2RL}\sin^{-1}R\right]$$

42

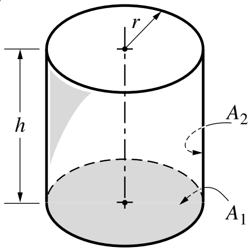


Inside surface of right-circular cylinder to itself

$$H = h/2r$$

$$F_{1-1} = 1 + H - \sqrt{1 + H^2}$$

43

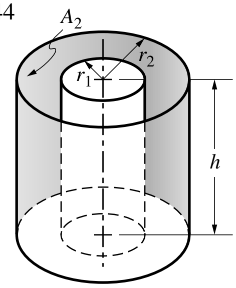


Base of right-circular cylinder to inside surface of cylinder

$$H = h/2r$$

$$F_{1-2} = 2H\left[\sqrt{1 + H^2} - H\right]$$

44

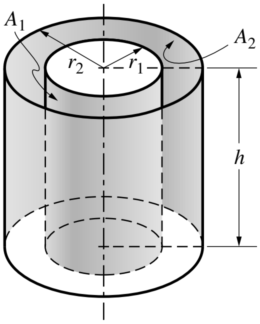


Interior of finite-length, right-circular coaxial cylinder to itself

$$R = r_2/r_1, \quad H = h/r_1$$

$$F_{2-2} = 1 - \frac{1}{R} - \frac{\sqrt{H^2 + 4R^2} - H}{4R} + \frac{1}{\pi}\left(\frac{2}{R}\tan^{-1}\frac{2\sqrt{R^2-1}}{H} - \frac{H}{2R}\left\{\frac{\sqrt{4R^2+H^2}}{H}\sin^{-1}\frac{H^2+4(R^2-1)-2H^2/R^2}{H^2+4(R^2-1)} - \sin^{-1}\frac{R^2-2}{R^2}\right\}\right)$$

45

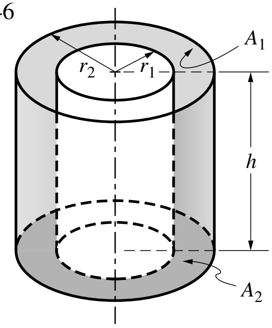


Interior of outer right-circular cylinder of finite length to exterior of inner right-circular coaxial cylinder

$$R = r_2/r_1, \quad H = h/r_1$$

$$F_{2-1} = \frac{1}{R}\left(1 - \frac{H^2+R^2-1}{4H} - \frac{1}{\pi}\left\{\cos^{-1}\frac{H^2-R^2+1}{H^2+R^2-1} - \frac{\sqrt{(H^2+R^2+1)^2-4R^2}}{2H}\cos^{-1}\frac{H^2-R^2+1}{R(H^2+R^2-1)} - \frac{H^2-R^2+1}{2H}\sin^{-1}\frac{1}{R}\right\}\right)$$

46



Interior of outer right-circular cylinder of finite length to annular end enclosing space between coaxial cylinders

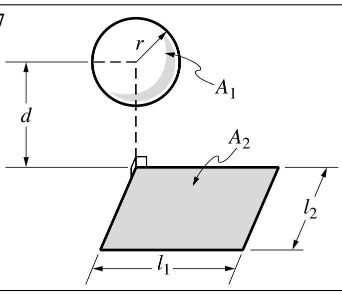
$$H = h/r_2, \quad R = r_1/r_2$$

$$X = \sqrt{1 - R^2}$$

$$Y = \frac{R(1 - R^2 - H^2)}{1 - R^2 + H^2}$$

$$F_{1-2} = \frac{1}{\pi}\left\{R\left(\tan^{-1}\frac{X}{H} - \tan^{-1}\frac{2X}{H}\right) + \frac{H}{4}\left[\sin^{-1}(2R^2-1) - \sin^{-1}R\right] + \frac{X^2}{4H}\left(\frac{\pi}{2} + \sin^{-1}R\right) - \frac{\sqrt{(1+R^2+H^2)^2 - 4R^2}}{4H}\left(\frac{\pi}{2} + \sin^{-1}Y\right) + \frac{\sqrt{4+H^2}}{4}\left[\frac{\pi}{2} + \sin^{-1}\left(1 - \frac{2R^2H^2}{4X^2+H^2}\right)\right]\right\}$$

47

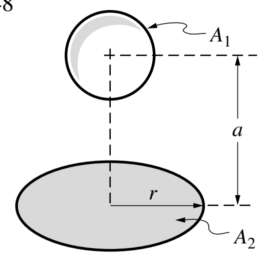


Sphere to rectangle, $r < d$

$$D_1 = d/l_1, \quad D_2 = d/l_2$$

$$F_{1-2} = \frac{1}{4\pi}\tan^{-1}\sqrt{\frac{1}{D_1^2 + D_2^2 + D_1^2 D_2^2}}$$

48

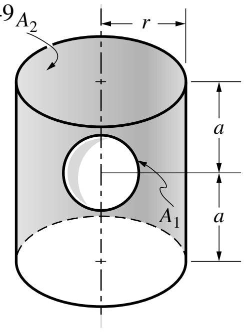


Sphere to coaxial disk

$$R = r/a$$

$$F_{1-2} = \frac{1}{2}\left[1 - \frac{1}{\sqrt{1+R^2}}\right]$$

49

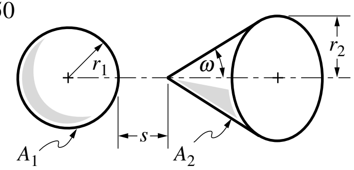


Sphere to interior surface of coaxial right-circular cylinder; sphere within ends of cylinder

$$R = r/a$$

$$F_{1-2} = \frac{1}{\sqrt{1+R^2}}$$

50



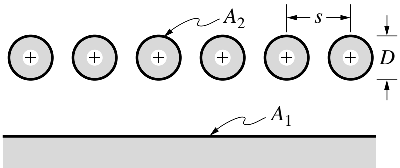
Sphere to coaxial cone

$$S = s/r_1, \quad R = r_2/r_1$$

for $\omega \geq \sin^{-1}\dfrac{1}{S+1}$:

$$F_{1-2} = \frac{1}{2}\left[1 - \frac{1+S+R\cot\omega}{\sqrt{(1+S+R\cot\omega)^2+R^2}}\right]$$

51



Infinite plane to row of cylinders

$$F_{1-2} = \frac{D}{s}\cos^{-1}\frac{D}{s} + 1 - \sqrt{1-\left(\frac{D}{s}\right)^2}$$

References

1. Howell, J. R.: *A Catalog of Radiation Configuration Factors*, McGraw-Hill, New York, 1982.
2. Howell, J. R., and M. P. Mengüç: "Radiative transfer configuration factor catalog: A listing of relations for common geometries," *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 112, pp. 910–912, 2011.
3. Wong, R. L.: "User's manual for CNVUFAC–the General Dynamics heat transfer radiation view factor program," Technical report, University of California, Lawrence Livermore National Laboratory, 1976.
4. Shapiro, A. B.: "FACET–a computer view factor computer code for axisymmetric, 2D planar, and 3D geometries with shadowing," Technical report, University of California, Lawrence Livermore National Laboratory, August 1983 (maintained by Nuclear Energy Agency under http://www.oecd-nea.org/tools/abstract/detail/nesc9578/).
5. Burns, P. J.: "MONTE–a two-dimensional radiative exchange factor code," Technical report, Colorado State University, Fort Collins, 1983.
6. Emery, A. F.: "VIEW–a radiation view factor program with interactive graphics for geometry definition (version 5.5.3)," Technical report, NASA computer software management and information center, Atlanta, 1986, (available from http://www.openchannelfoundation.org/projects/VIEW).
7. Ikushima, T.: "MCVIEW: A radiation view factor computer program or three-dimensional geometries using Monte Carlo method," Technical report, Japan Atomic Energy Research Institute (JAERI), 1986, (maintained by Nuclear Energy Agency under http://www.oecd-nea.org/tools/abstract/detail/nea-1166).
8. Jensen, C. L.: "TRASYS-II user's manual–thermal radiation analysis system," Technical report, Martin Marietta Aerospace Corp., Denver, 1987.

9. Walton, G. N.: "Algorithms for calculating radiation view factors between plane convex polygons with obstructions," in *Fundamentals and Applications of Radiation Heat Transfer*, vol. HTD-72, ASME, pp. 45–52, 1987.
10. Chin, J. H., T. D. Panczak, and L. Fried: "Spacecraft thermal modeling," *Int. J. Numer. Methods Eng.*, vol. 35, pp. 641–653, 1992.
11. Zeeb, C. N., P. J. Burns, K. Branner, and J. S. Dolaghan: "User's manual for Mont3d – Version 2.4," Colorado State University, Fort Collins, CO, 1999.
12. Walton, G. N.: "Calculation of obstructed view factors by adaptive integration," Technical Report NISTIR–6925, National Institute of Standards and Technology (NIST), Gaithersburg, MD, 2002.
13. MacFarlane, J. J.: "VISRAD-a 3D view factor code and design tool for high-energy density physics experiments," *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 81, pp. 287–300, 2003.
14. Keene, H. B.: "Calculation of the energy exchange between two fully radiative coaxial circular apertures at different temperatures," *Proc. Roy. Soc.*, vol. LXXXVIII-A, pp. 59–60, 1913.
15. Nusselt, W.: "Graphische Bestimming des Winkelverhältnisses bei der Wärmestrahlung," *VDI Zeitschrift*, vol. 72, p. 673, 1928.
16. Hottel, H. C.: "Radiant heat transmission between surfaces separated by non-absorbing media," *Transactions of ASME, Journal of Heat Transfer*, vol. 53, pp. 265–273, 1931.
17. Hottel, H. C., and F. P. Broughton: "Determination of true temperature and total radiation from luminous gas flames," *Industrial and Engineering Chemistry*, vol. 4, pp. 166–174, 1932.
18. Hottel, H. C., and J. D. Keller: "Effect of reradiation on heat transmission in furnaces and through openings," *Transactions of ASME, Journal of Heat Transfer*, vol. 55, pp. 39–49, 1933.
19. Hamilton, D. C., and W. R. Morgan: "Radiant interchange configuration factors," *NACA TN 2836*, 1952.
20. Hottel, H. C.: "Radiant heat transmission," in *Heat Transmission*, ed. W. H. McAdams, 3rd ed., ch. 4, McGraw-Hill, New York, 1954.
21. Leuenberger, H., and R. A. Pearson: "Compilation of radiant shape factors for cylindrical assemblies," ASME paper no. 56-A-144, 1956.
22. Jakob, M.: *Heat Transfer*, vol. 2, John Wiley & Sons, New York, 1957.
23. Usiskin, C. M., and R. Siegel: "Thermal radiation from a cylindrical enclosure with specified wall heat flux," *ASME Journal of Heat Transfer*, vol. 82, pp. 369–374, 1960.
24. Buschman, A. J., and C. M. Pittman: "Configuration factors for exchange of radiant energy between axisymmetrical sections of cylinders, cones, and hemispheres and their bases," *NASA TN D-944*, 1961.
25. Cunningham, F. G.: "Power input to a small flat plate from a diffusely radiating sphere with application to earth satellites," *NASA TN D-710*, 1961.
26. Moon, P.: *Scientific Basis of Illuminating Engineering*, Dover Publications, New York, 1961, (originally published by McGraw-Hill, New York, 1936).
27. Nichols, L. D.: "Surface-temperature distribution on thin-walled bodies subjected to solar radiation in interplanetary space," *NASA TN D-584*, 1961.
28. Plamondon, J. A.: "Numerical determination of radiation configuration factors for some common geometrical situations," Technical Report 32-127, California Institute of Technology, 1961.
29. Robbins, W. H.: "An analysis of thermal radiation heat transfer in a nuclear-rocket nozzle," *NASA TN D-586*, 1961.
30. Stevenson, J. A., and J. C. Grafton: "Radiation heat transfer analysis for space vehicles," Report SID-61-91, North American Aviation, 1961.
31. Stephens, C. W., and A. M. Haire: "Internal design considerations for cavity-type solar absorbers," *American Rocket Society Journal*, vol. 31, no. 7, pp. 896–901, 1961.
32. Goetze, D., and C. B. Grosch: "Earth-emitted infrared radiation incident upon a satellite," *Journal of Aerospace Science*, vol. 29, no. 11, pp. 521–524, 1962.
33. Joerg, P., and B. L. McFarland: "Radiation effects in rocket nozzles," Report S62–245, Aerojet-General Corporation, 1962.
34. Kreith, F.: *Radiation Heat Transfer for Spacecraft and Solar Power Design*, International Textbook Company, Scranton, PA, 1962.
35. Perry, R. L., and E. P. Speck: "Geometric factors for thermal radiation exchange between cows and their surroundings," *Trans. Am. Soc. Ag. Engnrs.*, vol. 5, no. 1, pp. 31–37, 1962.
36. Robbins, W. H., and C. A. Todd: "Analysis, feasibility, and wall-temperature distribution of a radiation-cooled nuclear-rocket nozzle," *NASA TN D-878*, 1962.
37. Sparrow, E. M., and E. R. G. Eckert: "Radiant interaction between fin and base surfaces," *ASME Journal of Heat Transfer*, vol. 84, no. 1, pp. 12–18, 1962.
38. Sparrow, E. M., L. U. Albers, and E. R. G. Eckert: "Thermal radiation characteristics of cylindrical enclosures," *ASME Journal of Heat Transfer*, vol. 84, pp. 73–81, 1962.
39. Sparrow, E. M., and V. K. Jonsson: "Absorption and emission characteristics of diffuse spherical enclosures," *NASA TN D-1289*, 1962.
40. Sparrow, E. M., and V. K. Jonsson: "Absorption and emission characteristics of diffuse spherical enclosures," *ASME Journal of Heat Transfer*, vol. 84, pp. 188–189, 1962.
41. Sparrow, E. M., G. B. Miller, and V. K. Jonsson: "Radiative effectiveness of annular-finned space radiators, including mutual irradiation between radiator elements," *Journal of the Aerospace Sciences*, vol. 29, no. 11, pp. 1291–1299, 1962.

42. Tripp, W., C. Hwang, and R. E. Crank: "Radiation shape factors for plane surfaces and spheres, circles, or cylinders," Spec. Rept. 16, Kansas State Univ. Bull., 1962.
43. Dunkle, R. V.: "Configuration factors for radiant heat-transfer calculations involving people," *ASME Journal of Heat Transfer*, vol. 85, no. 1, pp. 71–76, 1963.
44. Haller, H. C., and N. O. Stockman: "A note on fin-tube view factors," *ASME Journal of Heat Transfer*, vol. 85, no. 4, pp. 380–381, 1963.
45. Sparrow, E. M.: "A new and simpler formulation for radiative angle factors," *ASME Journal of Heat Transfer*, vol. 85, pp. 73–81, 1963.
46. Sparrow, E. M., and V. K. Jonsson: "Radiant emission characteristics of diffuse conical cavities," *Journal of the Optical Society of America*, vol. 53, pp. 816–821, 1963.
47. Sparrow, E. M., and V. K. Jonsson: "Thermal radiation absorption in rectangular-groove cavities," *ASME Journal of Applied Mechanics*, vol. E30, pp. 237–234, 1963.
48. Sparrow, E. M., and V. K. Jonsson: "Angle factors for radiant interchange between parallel-oriented tubes," *ASME Journal of Heat Transfer*, vol. 85, no. 4, pp. 382–384, 1963.
49. Wiebelt, J. A., and S. Y. Ruo: "Radiant-interchange configuration factors for finite right circular cylinders to rectangular planes," *International Journal of Heat and Mass Transfer*, vol. 6, no. 2, pp. 143–146, 1963.
50. Morizumi, S. J.: "Analytical determination of shape factors from a surface element to an axisymmetric surface," *AIAA Journal*, vol. 2, no. 11, pp. 2028–2030, 1964.
51. Sotos, C. J., and N. O. Stockman: "Radiant interchange view factors and limits of visibility for differential cylindrical surfaces with parallel generating lines," *NASA TN D-2556*, 1964.
52. Jones, L. R.: "Diffuse radiation view factors between two spheres," *ASME Journal of Heat Transfer*, vol. 87, no. 3, pp. 421–422, 1965.
53. Toups, K.: "A general computer program for the determination of radiant interchange configuration and form factors – CONFAC-I," Inc. Rept. SID-65-1043-1, North American Aviation, 1965.
54. Watts, R. G.: "Radiant heat transfer to earth satellites," *ASME Journal of Heat Transfer*, vol. 87, no. 3, pp. 369–373, 1965.
55. Bien, D. D.: "Configuration factors for thermal radiation from isothermal inner walls of cones and cylinders," *Journal of Spacecraft and Rockets*, vol. 3, no. 1, pp. 155–156, 1966.
56. Bobco, R. P.: "Radiation from conical surfaces with nonuniform radiosity," *AIAA Journal*, vol. 4, no. 3, pp. 544–546, 1966.
57. Feingold, A.: "Radiant-interchange configuration factors between various selected plane surfaces," *Proceedings of the Royal Society London*, vol. 292, no. 1428, pp. 51–60, 1966.
58. Kezios, S. P., and W. Wulff: "Radiative heat transfer through openings of variable cross sections," *Third International Heat Transfer Conference, AIChE*, vol. 5, pp. 207–218, 1966.
59. Mitalas, G. P., and D. G. Stephenson: "Fortran IV programs to calculate radiant interchange factors," Div. of Building Research Report DBR-25, National Research Council of Canada, 1966.
60. Wiebelt, J. A.: *Engineering Radiation Heat Transfer*, Holt, Rinehart & Winston, New York, 1966.
61. Farnbach, J. S.: "Radiant interchange between spheres: Accuracy of the point-source approximation," Technical Memo SC-TM-364, Sandia Laboratories, 1967.
62. Hottel, H. C., and A. F. Sarofim: *Radiative Transfer*, McGraw-Hill, New York, 1967.
63. Hsu, C. J.: "Shape factor equations for radiant heat transfer between two arbitrary sizes of rectangular planes," *Canadian Journal of Chemical Engineering*, vol. 45, no. 1, pp. 58–60, 1967.
64. Holcomb, R. S., and F. E. Lynch: "Thermal radiation performance of a finned tube with a reflector," Technical Report ORNL-TM-1613, Oak Ridge National Laboratory, 1967.
65. Stasenko, A. L.: "Self-irradiation coefficient of a Moebius strip of given shape," *Akad. Nauk, SSSR, Izv. Energetika Transport*, pp. 104–107, 1967.
66. Campbell, J. P., and D. G. McConnell: "Radiant interchange configuration factors for spherical and conical surfaces to spheres," *NASA TN D-4457*, 1968.
67. Hauptmann, E. G.: "Angle factors between a small flat plate and a diffusely radiating sphere," *AIAA Journal*, vol. 6, no. 5, pp. 938–939, 1968.
68. Liebert, C. H., and R. R. Hibbard: "Theoretical temperatures of thin-film solar cells in earth orbit," *NASA TN D-4331*, 1968.
69. Edwards, D. K.: "Comment on 'radiation from conical surfaces with nonuniform radiosity'," *AIAA Journal*, vol. 7, no. 8, pp. 1656–1659, 1969.
70. Grier, N. T.: "Tabulations of configuration factors between and two spheres and their parts," *NASA SP-3050*, 1969.
71. Grier, N. T., and R. D. Sommers: "View factors for toroids and their parts," *NASA TN D-5006*, 1969.
72. Lovin, J. K., and A. W. Lubkowitz: "User's manual for RAVFAC, a radiation view factor digital computer program," Lockheed Missiles and Space Rept. HREC-0154-1, Huntsville Research Park, 1969.
73. Sommers, R. D., and N. T. Grier: "Radiation view factors for a toroid: Comparison of Eckert's technique and direct computation," *ASME Journal of Heat Transfer*, vol. 91, no. 3, pp. 459–461, 1969.
74. Wakao, N., K. Kato, and N. Furuya: "View factor between two hemispheres in contact and radiation heat-transfer coefficient in packed beds," *International Journal of Heat and Mass Transfer*, vol. 12, pp. 118–120, 1969.
75. Feingold, A., and K. G. Gupta: "New analytical approach to the evaluation of configuration factors in radiation from spheres and infinitely long cylinders," *ASME Journal of Heat Transfer*, vol. 92, no. 1, pp. 69–76, 1970.

76. O'Brien, P. F., and R. B. Luning: "Experimental study of luminous transfer in architectural systems," *Illum. Engng.*, vol. 65, no. 4, pp. 193–198, 1970.
77. Rein, R. G., C. M. Sliepcevich, and J. R. Welker: "Radiation view factors for tilted cylinders," *Journal of Fire and Flammability*, vol. 1, pp. 140–153, 1970.
78. Sparrow, E. M., and R. P. Heinisch: "The normal emittance of circular cylindrical cavities," *Applied Optics*, vol. 9, pp. 2569–2572, 1970.
79. Sydnor, C. L.: "A numerical study of cavity radiometer emissivities," NASA Contractor Rept. 32-1462, Jet Propulsion Lab., 1970.
80. Bernard, J. J., and J. Genot: "Royonnement thermique des surfaces de revolution," *International Journal of Heat and Mass Transfer*, vol. 14, no. 10, pp. 1611–1619, 1971.
81. McAdam, D. W., A. K. Khatry, and M. Iqbal: "Configuration factors for greenhouses," *Am. Soc. Ag. Engineers*, vol. 14, no. 6, pp. 1068–1092, 1971.
82. Crawford, M. E.: "Configuration factor between two unequal, parallel, coaxial squares," ASME paper no. 72-WT/HT-16, November 1972.
83. Chung, B. T. F., and P. S. Sumitra: "Radiation shape factors from plane point sources," *ASME Journal of Heat Transfer*, vol. 94, pp. 328–330, 1972.
84. Sowell, E. F., and P. F. O'Brien: "Efficient computation of radiant-interchange factors within an enclosure," *ASME Journal of Heat Transfer*, vol. 49, no. 3, pp. 326–328, 1972.
85. Ballance, J. O., and J. Donovan: "Radiation configuration factors for annular rings and hemispherical sectors," *ASME Journal of Heat Transfer*, vol. 95, no. 2, pp. 275–276, 1973.
86. Masuda, H.: "Radiant heat transfer on circular-finned cylinders," *Rep. Inst. High Speed Mechanics*, vol. 27, no. 225, pp. 67–89, 1973.
87. Reid, R. L., and J. S. Tennant: "Annular ring view factors," *AIAA Journal*, vol. 11, no. 10, pp. 1446–1448, 1973.
88. Holchendler, J., and W. F. Laverty: "Configuration factors for radiant heat exchange in cavities bounded at the ends by parallel disks and having conical centerbodies," *ASME Journal of Heat Transfer*, vol. 96, no. 2, pp. 254–257, 1974.
89. Sauer, H. J.: "Configuration factors for radiant energy interchange with triangular areas," *ASHRAE Trans.*, vol. 80, no. 2322, pp. 268–279, 1974.
90. Alfano, G., and A. Sarno: "Normal and hemispherical thermal emittances of cylindrical cavities," *ASME Journal of Heat Transfer*, vol. 97, no. 3, pp. 387–390, 1975.
91. Bartell, F. O., and W. L. Wolfe: "New approach for the design of blackbody simulators," *Applied Optics*, vol. 14, no. 2, pp. 249–252, 1975.
92. Rea, S. N.: "Rapid method for determining concentric cylinder radiation view factors," *AIAA Journal*, vol. 13, no. 8, pp. 1122–1123, 1975.
93. Boeke, W., and L. Wall: "Radiative exchange factors in rectangular spaces for the determination of mean radiant temperatures," *Build. Serv. Engng.*, vol. 43, pp. 244–253, 1976.
94. Cox, R. L.: "Radiative heat transfer in arrays of parallel cylinders," Ph.D. thesis, University of Tennessee, Knoxville, Tennessee, 1976.
95. Juul, N. H.: "Diffuse radiation configuration view factors between two spheres and their limits," *Letters in Heat and Mass Transfer*, vol. 3, no. 3, pp. 205–211, 1976.
96. Juul, N. H.: "Investigation of approximate methods for calculation of the diffuse radiation configuration view factors between two spheres," *Letters in Heat and Mass Transfer*, vol. 3, pp. 513–522, 1976.
97. Minning, C. P.: "Calculation of shape factors between parallel ring sectors sharing a common centerline," *AIAA Journal*, vol. 14, no. 6, pp. 813–815, 1976.
98. Minning, C. P.: "Calculation of shape factors between rings and inverted cones sharing a common axis," *ASME Journal of Heat Transfer*, vol. 99, no. 3, pp. 492–494, 1977.
99. Feingold, A.: "A new look at radiation configuration factors between disks," *ASME Journal of Heat Transfer*, vol. 100, no. 4, pp. 742–744, 1978.
100. Felske, J. D.: "Approximate radiation shape factors between two spheres," *ASME Journal of Heat Transfer*, vol. 100, no. 3, pp. 547–548, 1978.
101. Sparrow, E. M., and R. D. Cess: *Radiation Heat Transfer*, Hemisphere, New York, 1978.
102. Chekhovskii, I. R., V. V. Sirotkin, V. C. Yu, and V. A. Chebanov: "Determination of radiative view factors for rectangles of different sizes," *High Temperature*, July 1979.
103. Garot, C., and P. Gendre: "Computation of view factors used in radiant energy exchanges in axisymmetric geometry," in *Numerical Methods in Thermal Problems; Proc. First Intl. Conf.*, Pineridge Press, Ltd., Swansea, Wales, 1979.
104. Juul, N. H.: "Diffuse radiation view factors from differential plane sources to spheres," *ASME Journal of Heat Transfer*, vol. 101, no. 3, pp. 558–560, 1979.
105. Minning, C. P.: "Shape factors between coaxial annular disks separated by a solid cylinder," *AIAA Journal*, vol. 17, no. 3, pp. 318–320, 1979.
106. Minning, C. P.: "Radiation shape factors between end plane and outer wall of concentric tubular enclosure," *AIAA Journal*, vol. 17, no. 12, pp. 1406–1408, 1979.
107. Currie, I. G., and W. W. Martin: "Temperature calculations for shell enclosures subjected to thermal radiation," *Computat. Methods Appl. Mech. Engng.*, vol. 21, no. 1, pp. 75–79, 1980.
108. Hahne, E., and M. K. Bassiouni: "The angle factor for radiant interchange within a constant radius cylindrical enclosure," *Letters in Heat and Mass Transfer*, vol. 7, pp. 303–309, 1980.

109. Modest, M. F.: "Solar flux incident on an orbiting surface after reflection from a planet," *AIAA Journal*, vol. 18, no. 6, pp. 727–730, 1980.
110. Yuen, W. W.: "A simplified approach to shape-factor calculation between three-dimensional planar objects," *ASME Journal of Heat Transfer*, vol. 102, no. 2, pp. 386–388, 1980.
111. Chung, B. T. F., and M. H. N. Naraghi: "Some exact solutions for radiation view factors from spheres," *AIAA Journal*, vol. 19, no. 8, pp. 1077–1081, 1981.
112. Gross, U., K. Spindler, and E. Hahne: "Shape factor equations for radiation heat transfer between plane rectangular surfaces of arbitrary position and size with parallel boundaries," *Letters in Heat and Mass Transfer*, vol. 8, p. 219, 1981.
113. Ameri, A., and J. D. Felske: "Radiation configuration factors for obliquely oriented finite length circular cylinders," *International Journal of Heat and Mass Transfer*, vol. 33, no. 1, pp. 728–736, 1982.
114. Chung, T. J., and J. Y. Kim: "Radiation view factors by finite elements," *ASME Journal of Heat Transfer*, vol. 104, p. 792, 1982.
115. Chung, B. T. F., and M. H. N. Naraghi: "A simpler formulation for radiative view factors from spheres to a class of axisymmetric bodies," *ASME Journal of Heat Transfer*, vol. 104, p. 201, 1982.
116. Juul, N. H.: "View factors in radiation between two parallel oriented cylinders," *ASME Journal of Heat Transfer*, vol. 104, p. 235, 1982.
117. Kadaba, P. V.: "Thermal radiation view factor methods accuracy and computer-aided procedures," Contract Report NGT-01-002-099, NASA/ASEE, 1982.
118. Naraghi, M. H. N., and B. T. F. Chung: "Radiation configuration factors between disks and a class of axisymmetric bodies," *ASME Journal of Heat Transfer*, vol. 104, p. 426, 1982.
119. Buraczewski, C., and J. Stasiek: "Application of generalized Pythagoras theorem to calculation of configuration factors between surfaces of channels of revolution," *International Journal of Heat and Fluid Flow*, vol. 4, no. 3, pp. 157–160, 1983.
120. Lipps, F. W.: "Geometric configuration factors for polygonal zones using Nusselt's unit sphere," *Solar Energy*, vol. 30, no. 5, pp. 413–419, 1983.
121. Chung, B. T. F., M. M. Kermani, and M. H. N. Naraghi: "A formulation of radiation view factors from conical surfaces," *AIAA Journal*, vol. 22, no. 3, pp. 429–436, 1984.
122. Mahbod, B., and R. L. Adams: "Radiation view factors between axisymmetric subsurfaces within a cylinder with spherical centerbody," *ASME Journal of Heat Transfer*, vol. 106, no. 1, p. 244, 1984.
123. Yarbrough, D. W., and C. L. Lee: "Monte Carlo calculation of radiation view factors," in *Integral Methods in Sciences and Engineering*, eds. F. R. Payne et al., Harper and Rowe/Hemisphere, 1984.
124. Eichberger, J. I.: "Calculation of geometric configuration factors in an enclosure whose boundary is given by an arbitrary polygon in the plane," *Wärme- und Stoffübertragung*, vol. 19, no. 4, p. 269, 1985.
125. Mathiak, F. U.: "Berechnung von konfigurationsfaktoren polygonal berandeter ebener gebiete (calculation of form-factors for plane areas with polygonal boundaries)," *Wärme- und Stoffübertragung*, vol. 19, no. 4, p. 273, 1985.
126. Shapiro, A. B.: "Computer implementation, accuracy and timing of radiation view factor algorithms," *ASME Journal of Heat Transfer*, vol. 107, no. 3, pp. 730–732, 1985.
127. Shukla, K. N., and D. Ghosh: "Radiation configuration factors for concentric cylinder bodies in enclosure," *Indian Journal of Technology*, vol. 23, pp. 244–246, 1985.
128. Lin, S., P. M. Lee, J. C. Y. Wang, Y. L. Dai, and Y. S. Lou: "Radiant-interchange configuration factors between disk and segment of parallel concentric disk," *ASME Journal of Heat Transfer*, vol. 29, no. 3, pp. 501–503, 1986.
129. Maxwell, G. M., M. J. Bailey, and V. W. Goldschmidt: "Calculations of the radiation configuration factor using ray casting," *Computer Aided Design*, vol. 18, no. 7, p. 371, 1986.
130. Stefanizzi, P.: "Reliability of the Monte Carlo method in black body view factor determination," *Termotechnica*, vol. 40, no. 6, p. 29, 1986.
131. Wang, J. C. Y., S. Lin, P. M. Lee, W. L. Dai, and Y. S. Lou: "Radiant-interchange configuration factors inside segments of frustum enclosures of right circular cones," *International Communications in Heat and Mass Transfer*, vol. 13, pp. 423–432, 1986.
132. Eddy, T. L., and G. E. Nielsson: "Radiation shape factors for channels with varying cross-section," *ASME Journal of Heat Transfer*, vol. 110, no. 1, pp. 264–266, 1988.
133. Frankel, J. I., and T. P. Wang: "Radiative exchange between gray fins using a coupled integral equation formulation," *Journal of Thermophysics and Heat Transfer*, vol. 2, no. 4, pp. 296–302, Oct 1988.
134. Modest, M. F.: "Radiative shape factors between differential ring elements on concentric axisymmetric bodies," *Journal of Thermophysics and Heat Transfer*, vol. 2, no. 1, pp. 86–88, 1988.
135. Mel'man, M. M., and G. G. Trayanov: "View factors in a system of parallel contacting cylinders," *Journal of Engineering Physics*, vol. 54, no. 4, p. 401, 1988.
136. Naraghi, M. H. N.: "Radiation view factors from differential plane sources to disks—a general formulation," *Journal of Thermophysics and Heat Transfer*, vol. 2, no. 3, pp. 271–274, 1988.
137. Naraghi, M. H. N.: "Radiative view factors from spherical segments to planar surfaces," *Journal of Thermophysics and Heat Transfer*, vol. 2, no. 4, pp. 373–375, Oct 1988.
138. Naraghi, M. H. N., and J. P. Warna: "Radiation configuration factors from axisymmetric bodies to plane surfaces," *International Journal of Heat and Mass Transfer*, vol. 31, no. 7, pp. 1537–1539, 1988.
139. Sabet, M., and B. T. F. Chung: "Radiation view factors from a sphere to nonintersecting planar surfaces," *Journal of Thermophysics and Heat Transfer*, vol. 2, no. 3, pp. 286–288, 1988.

140. Chung, B. T. F., and M. M. Kermani: "Radiation view factors from a finite rectangular plate," *ASME Journal of Heat Transfer*, vol. 111, no. 4, p. 1115, 1989.
141. van Leersum, J.: "A method for determining a consistent set of radiation view factors from a set generated by a nonexact method," *International Journal of Heat and Fluid Flow*, vol. 10, no. 1, p. 83, 1989.
142. Bornside, D. E., and R. A. Brown: "View factor between differing-diameter, coaxial disks blocked by a coaxial cylinder," *Journal of Thermophysics and Heat Transfer*, vol. 4, no. 3, pp. 414–416, 1990.
143. Saltiel, C., and M. H. N. Naraghi: "Radiative configuration factors from cylinders to coaxial axisymmetric bodies," *International Journal of Heat and Mass Transfer*, vol. 33, no. 1, pp. 215–218, 1990.
144. Tseng, J. W. C., and W. Strieder: "View factors for wall to random dispersed solid bed transport," *ASME Journal of Heat Transfer*, vol. 112, pp. 816–819, 1990.
145. Emery, A. F., O. Johansson, M. Lobo, and A. Abrous: "A comparative study of methods for computing the diffuse radiation viewfactors for complex structures," *ASME Journal of Heat Transfer*, vol. 113, no. 2, pp. 413–422, 1991.
146. Rushmeier, H. E., D. R. Baum, and D. E. Hall: "Accelerating the hemi-cube algorithm for calculating radiation form factors," *ASME Journal of Heat Transfer*, vol. 113, no. 4, pp. 1044–1047, 1991.
147. Sika, J.: "Evaluation of direct-exchange areas for a cylindrical enclosure," *ASME Journal of Heat Transfer*, vol. 113, no. 4, pp. 1040–1043, 1991.
148. Ambirajan, A., and S. P. Venkateshan: "Accurate determination of diffuse view factors between planar surfaces," *International Journal of Heat and Mass Transfer*, vol. 36, no. 8, pp. 2203–2208, 1993.
149. Beard, A., D. Drysdale, and P. Holborn: "Configuration factor for radiation in a tunnel or partial cylinder," *Fire Technology*, vol. 29, no. 3, pp. 281–288, 1993.
150. Byrd, L. W.: "View factor algebra for two arbitrary sized non-opposing parallel rectangles," *ASME Journal of Heat Transfer*, vol. 115, pp. 517–518, 1993.
151. Ehlert, J. R., and T. F. Smith: "View factors for perpendicular and parallel, rectangular plates," *Journal of Thermophysics and Heat Transfer*, vol. 7, no. 1, pp. 173–174, 1993.
152. Guelzim, A., J. M. Souil, and J. P. Vantelon: "Suitable configuration factors for radiation calculation concerning tilted flames," *ASME Journal of Heat Transfer*, vol. 115, no. 2, pp. 489–491, May 1993.
153. Murty, C. V. S.: "Evaluation of radiation reception factors in a rotary kiln using a modified Monte Carlo scheme," *International Journal of Heat and Mass Transfer*, vol. 36, no. 1, pp. 119–132, 1993.
154. Noboa, H. L., D. O'Neal, and W. D. Turner: "Calculation of the shape factor from a small rectangular plane to a triangular surface perpendicular to the rectangular plane without a common edge," *ASME Journal of Solar Energy Engineering*, vol. 115, pp. 117–119, 1993.
155. Brockmann, H.: "Analytic angle factors for the radiant interchange among the surface elements of two concentric cylinders," *International Journal of Heat and Mass Transfer*, vol. 37, no. 7, pp. 1095–1100, 1994.
156. Flouros, M., S. Bungart, and W. Leiner: "Calculation of the view factors for radiant heat exchange in a new volumetric receiver with tapered ducts," *ASME Journal of Solar Energy Engineering*, vol. 117, pp. 58–60, 1995.
157. Hollands, K. G. T.: "On the superposition rule for configuration factors," *ASME Journal of Heat Transfer*, vol. 117, no. 1, pp. 241–244, 1995.
158. Lawson, D. A.: "An improved method for smoothing approximate exchange areas," *International Journal of Heat and Mass Transfer*, vol. 38, no. 16, pp. 3109–3110, 1995.
159. Loehrke, R. I., J. S. Dolaghan, and P. J. Burns: "Smoothing Monte Carlo exchange factors," *ASME Journal of Heat Transfer*, vol. 117, no. 2, pp. 524–526, 1995.
160. Rao, V. R., and V. M. K. Sastri: "Efficient evaluation of diffuse view factors for radiation," *International Journal of Heat and Mass Transfer*, vol. 39, pp. 1281–1286, 1996.
161. Krishnaprakas, C. K.: "View factor between inclined rectangles," *Journal of Thermophysics and Heat Transfer*, vol. 11, no. 3, pp. 480–482, 1997.
162. Li, B. W., W. Q. Tao, and R. X. Liu: "Ray effect in ray tracing method for radiative heat transfer," *International Journal of Heat and Mass Transfer*, vol. 40, no. 14, pp. 3419–3426, 1997.
163. Mavroulakis, A., and A. Trombe: "A new semianalytical algorithm for calculating diffuse plane view factors," *ASME Journal of Heat Transfer*, vol. 120, no. 1, pp. 279–282, 1998.
164. Tso, C. P., and S. P. Mahulikar: "View factors between finite length rings on an interior cylindrical shell," *Journal of Thermophysics and Heat Transfer*, vol. 13, no. 3, pp. 375–379, 1999.
165. Katte, S. S., and S. P. Venkateshan: "Accurate determination of view factors in axisymmetric enclosures with shadowing bodies inside," *Journal of Thermophysics and Heat Transfer*, vol. 14, no. 1, pp. 68–76, 2000.
166. Howell, J. R., R. Siegel, and M. P. Mengüç: *Thermal Radiation Heat Transfer*, 4th ed., Taylor and Francis-Hemisphere, Washington, 2011.