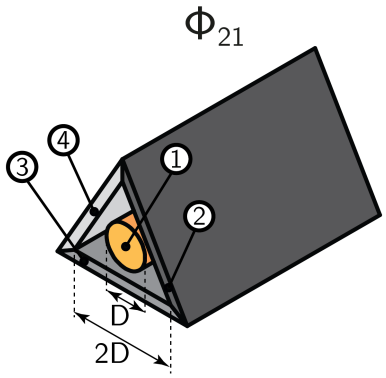
View Factor 25

A long equilateral triangular body has a long cylinder inside. Determine the view factor Φ_{21}:



A solid cylinder can never see itself and therefore:

$$\Phi_{11} = 0$$

From symmetry it can be seen that $\Phi_{12} = \Phi_{13} = \Phi_{14}$, combining this with the summation rule ($\Phi_{11} + \Phi_{12} + \Phi_{13} + \Phi_{14} = 1$) it yields:

$$\Phi_{12} = \frac{1}{3}$$

Using the reciprocity rule $A_1\Phi_{12} = A_2\Phi_{21}$ one finds:

$$\Phi_{21} = \Phi_{12}\frac{A_1}{A_2} = \frac{1}{3} \cdot \frac{\pi DL}{2DL} = \frac{\pi}{6}$$