

## Tutorial 7b: Long-wave radiation

Q1. What is a *view factor*?

A *view factor* is a measure of the geometric relationship between two surfaces and is used in calculations relating to radiation exchange. A value of 0 indicates zero exchange potential while a value of 1 indicates that all radiation leaving one surface will arrive at the other.

Q2. How might view factors be determined numerically for an energy system of arbitrary geometric complexity?

Inter-surface view factors may be determined numerically by dividing both surfaces into a number of finite elements and then

for each element in surface 1:

place a unit hemisphere at the element centre;

discretise the hemisphere into patches;

for each patch:

- extend a ray from the centre point of the hemisphere base circle through the patch centroid;
- determine the point of intersection (element) with surface 2 (if any) and calculate the point view factor from the two elemental areas and angles;

sum over all patches;

sum over all elements in surface 1.