Sage Model Notes
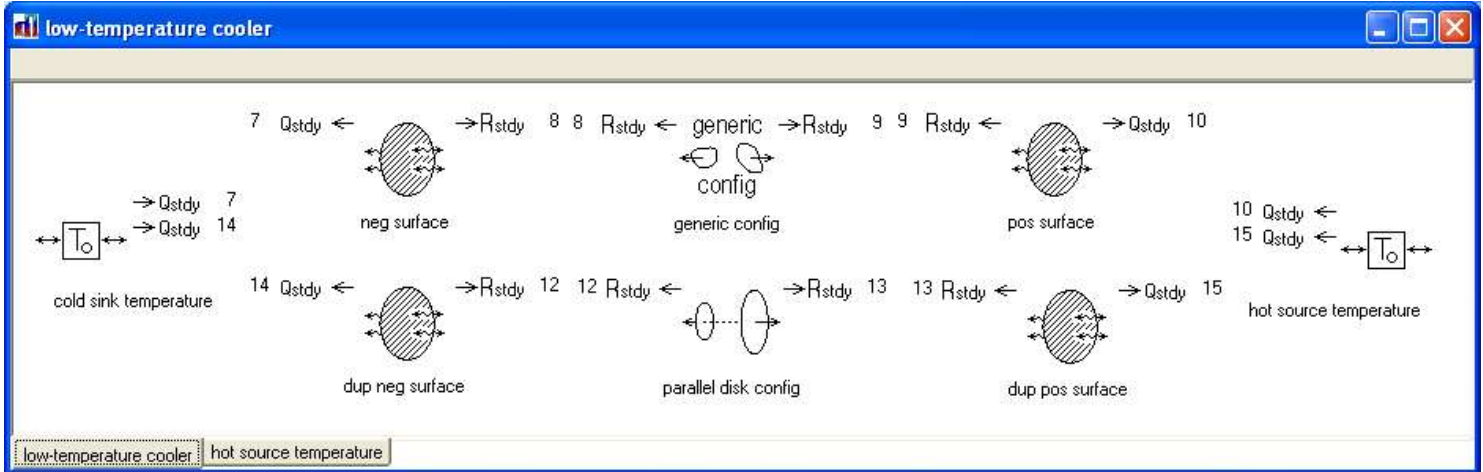
RadGeneric.scfn

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An example of how to use the generic view configuration component. A generic view configuration is set up to duplicate the pre-programmed parallel-disk view configuration in the context of a simple radiation transfer model:

This is not a model of an actual radiation enclosure. Rather it is just a validation of the generic view configuration. There are two parallel radiation paths between identical radiation surfaces anchored to the same temperatures. The path in the top row use the generic view configuration and the path in the bottom row uses the parallel-disk view configuration The purpose of the model is to demonstrate how to set up the generic view configuration to behave identically to the parallel-disk view configuration.

Parallel Disk Configuration Summary

According to the Sage manual the parallel-disk view configuration corresponds to two parallel coaxial disks of areas A_n and A_p separated by distance s.
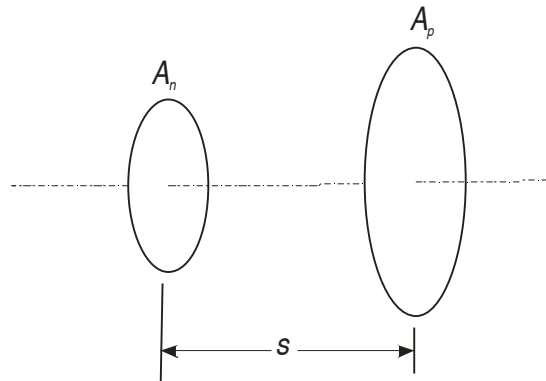
Distance s is the input Sepr. The FA product (either $F_{np} A_n$ or $F_{pn} A_p$ is

$$FA = \frac{1}{2}\left(Y - \sqrt{Y^2 - 4A_n A_p}\right)$$

where

$$Y = \pi s^2 + A_n + A_p$$

Generic Configuration Equivalent

To make the generic view configuration do the same thing the input FA is recast in terms of a user-defined input Sepr and user-defined dependent variable Y. The details are shown here:

```
Inputs
  Sepr          disk separation distance (m)          1.000E-01
Recasts
  FA = 0.5 * (Y - Sqrt(Sqr(Y) - 4*An*Ap))
Outputs
  Y                                       3.182E-02
    Pi*Sqr(Sepr) + An + Ap
```

Variables An and Ap are the built-in outputs that reference the attached surface areas A_n and A_p.

Same Radiation transfer

The net radiation transfer through the two view factors is given by the RadNeg or RadPos ouputs which are the same. This verifies that the two view configurations are equivalent.