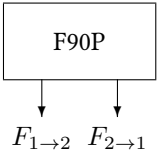


Block F90P

The F90P block calculates the radiation shape factor of two perpendicular rectangles without a common edge.



Name	F90P
Function	bs0019
Inputs	0
Outputs	2
Parameters	9
Strings	0
Group	C

Inputs

None

Outputs

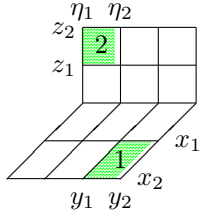
- 1
- Radiation shape factor $F_{1 \rightarrow 2}$
- 2
- Radiation shape factor $F_{2 \rightarrow 1}$

Parameters

- 1
- x -coordinate displacement x_1 of area 1 (sender)
- 2
- x_2 coordinate of area 1 (width + x_1)
- 3
- y -coordinate displacement y_1 of area 1 (sender)
- 4
- y_2 coordinate of area 1 (depth + y_1)
- 5
- x -coordinate displacement x_1 of area 2 (receiver)
- 6
- x_2 coordinate of area 2 (width + x_1)
- 7
- z -coordinate displacement z_1 of area 2 (receiver)
- 8
- z_2 coordinate of area 2 (height + z_1)

Strings

None



According to Howell the governing equation is

$$F_{1 \rightarrow 2} = \frac{1}{2\pi(x_2 - x_1)(y_2 - y_1)} \sum_{l=1}^2 \sum_{k=1}^2 \sum_{j=1}^2 \sum_{i=1}^2 (-1)^{i+j+k+l} G(x_i, y_j, \eta_k, z_l)$$

where

$$G = (y - \eta) \sqrt{x^2 + z^2} \arctan \left(\frac{y - \eta}{\sqrt{x^2 + z^2}} \right) - \frac{1}{4} (x^2 + z^2 - (y - \eta)^2) \ln(x^2 + z^2 + (y - \eta)^2)$$