

Appendix E

ESARAD radiative analyser - development status

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ESARAD Development Status

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Date: 30th Oct 2007

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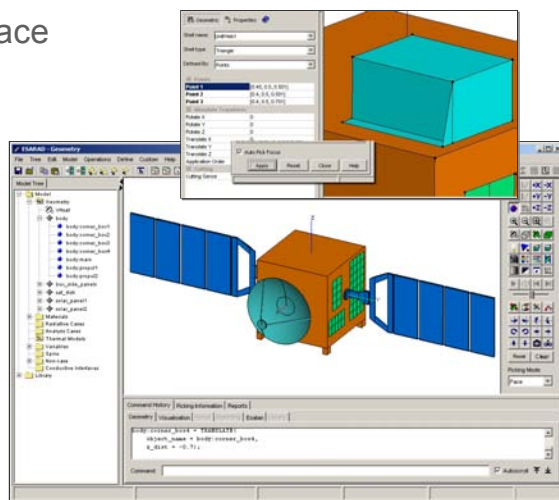
Aerospace

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ESARAD 6.0

Released as promised in March 2007;

- Improved layout of User Interface
- Interactive model construction
- Performance improvements



ESARAD Status - 27 Oct 2007 - P 2

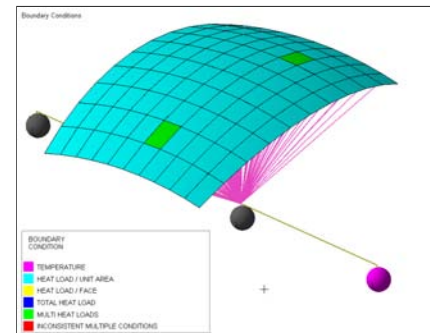
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ESARAD 6.2

Release November 2007

- Non-geometric thermal node elements
- User defined (non-geometric) conductors
- Boundary Conditions
- Improved Analysis Case mechanism and interface
- Orbital ephemeris support (incl. import from STK)
- Option for compatibility with Sinda/G
- Automated database upgrade for 6.0 models



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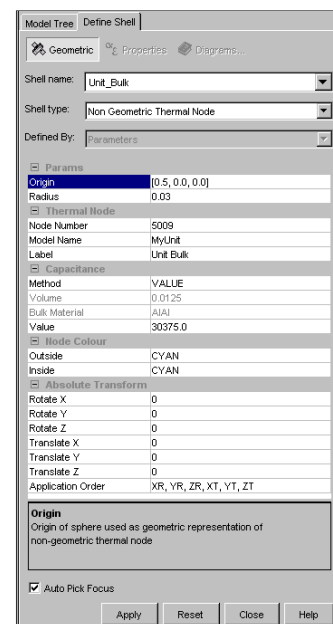
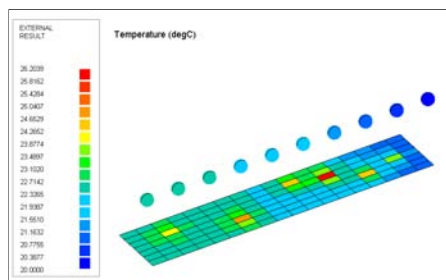
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Non-geometric thermal nodes

- New shell type
- Option to visualise nodes
 - Included in pre/post displays



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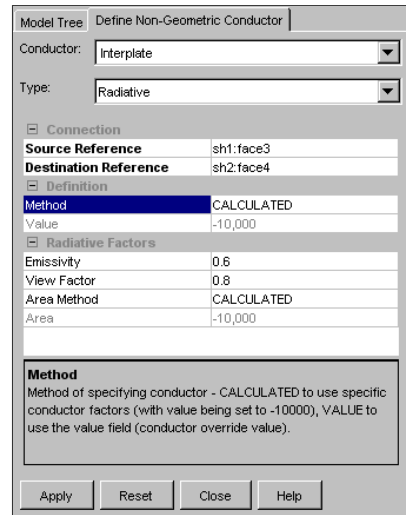
ESARAD 6.2

User defined (non-geometric) conductors;

- Conductive
- Convective
- Radiative
- Advective

Source–Destination defined with;

- Node number
- Face
- Shell side
- Non-geometric node shell



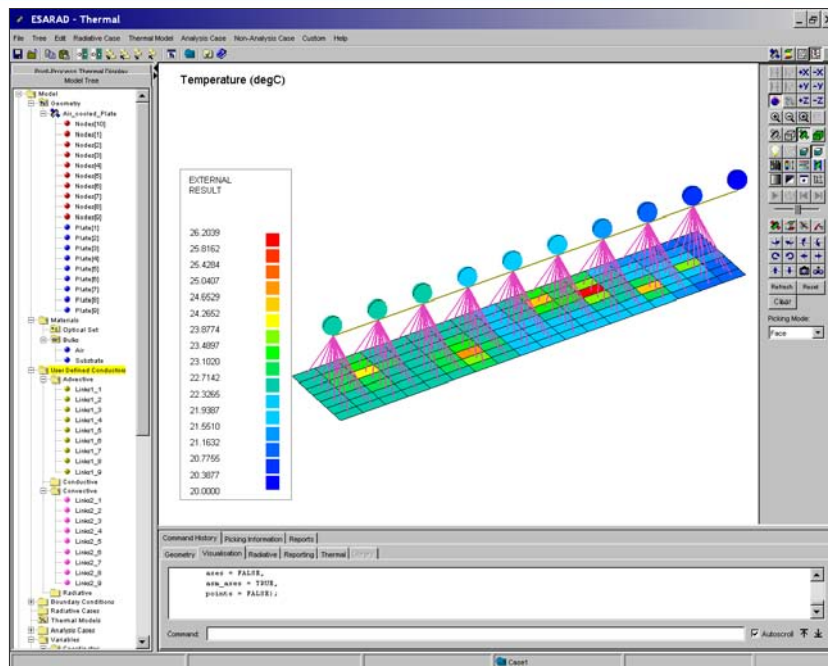
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ESARAD 6.2

Visualisation of user defined conductors



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ESARAD 6.2

Format of user defined links in generated model;

- Conductive (GL = K.A/l)
 - GL(1001,1003) = 180.00 * 0.10; # from conductor Doubler**
- Convective (GL = h.A)
 - GL(2110,1007) = 1.00 * 0.00143; # from conductor Links2_6**
- Radiative (GR = A.Eps.vf)
 - GR(1001,2001) = 0.25 * 0.60 * 0.80; # from conductor Inter_plate**
- Advective (GF = m.Cp)
 - GF(1001,1002) = 1.005 * 0.240; # from conductor Links1_1**

Easier validation/modification

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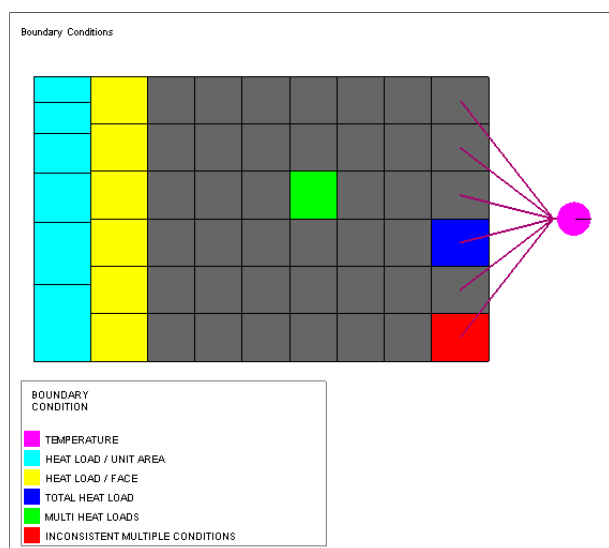
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Boundary Conditions

- Initial Temperature
- (Fixed) Temperature
- Heat Load
 - per unit area
 - per face
 - Total
- Pre-processing
 - Values
 - Types



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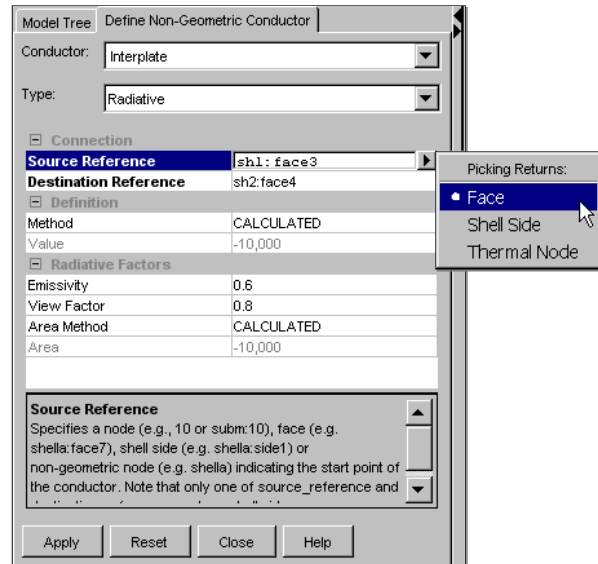
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Picking mode selection

- User defined conductors
 - Thermal Node (number)
 - Face
 - Shell side
- Boundary conditions add
 - Shell



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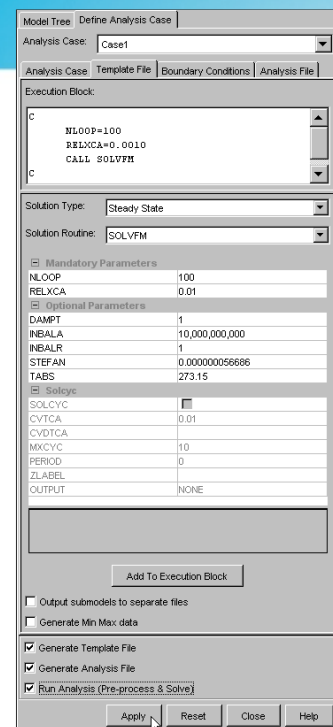
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Improvements to Analysis Case and interface

- Replaced multiple forms and “wizard” with single tabbed interface
- Improved work-flow
- Improved control of template file
- Analysis file options saved



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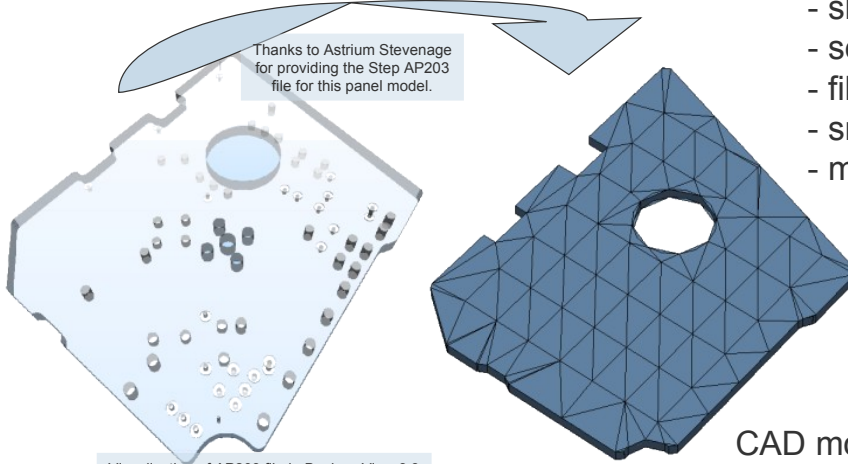
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CAD Interface

Automatic translation
STEP AP203 to ESARAD "erg"

Thanks to Astrium Stevenage
for providing the Step AP203
file for this panel model.



- Automated;
- shape recognition
 - selective hole removal
 - fillet removal
 - small element removal
 - meshing

CAD model hierarchy retained

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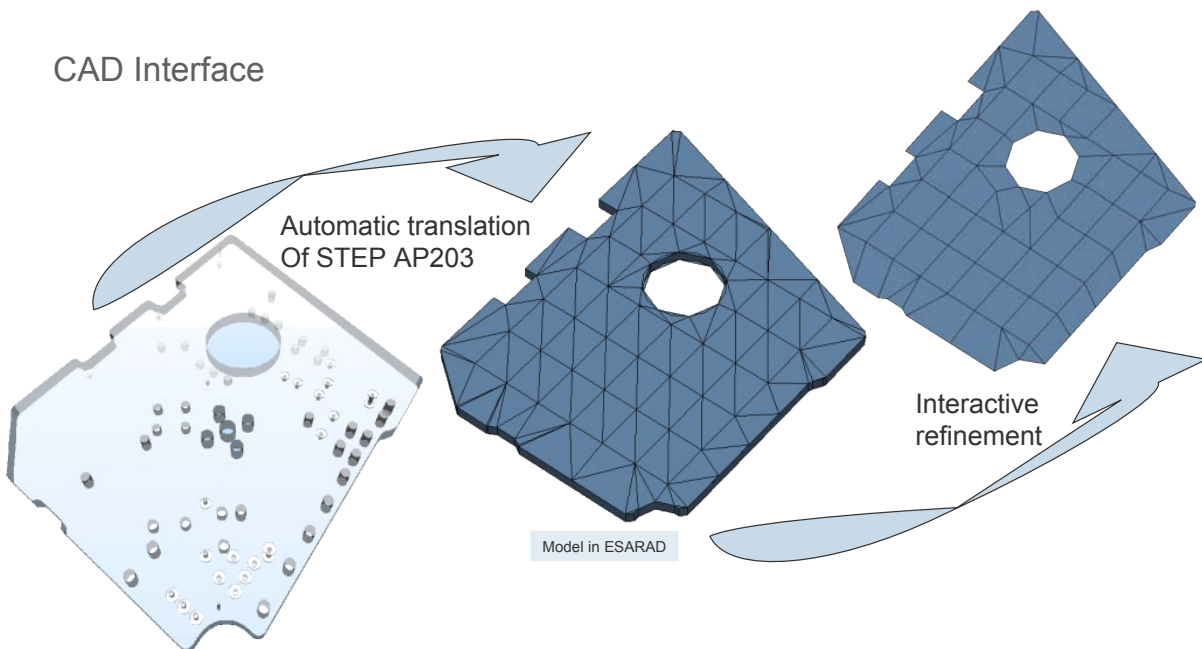
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CAD Interface

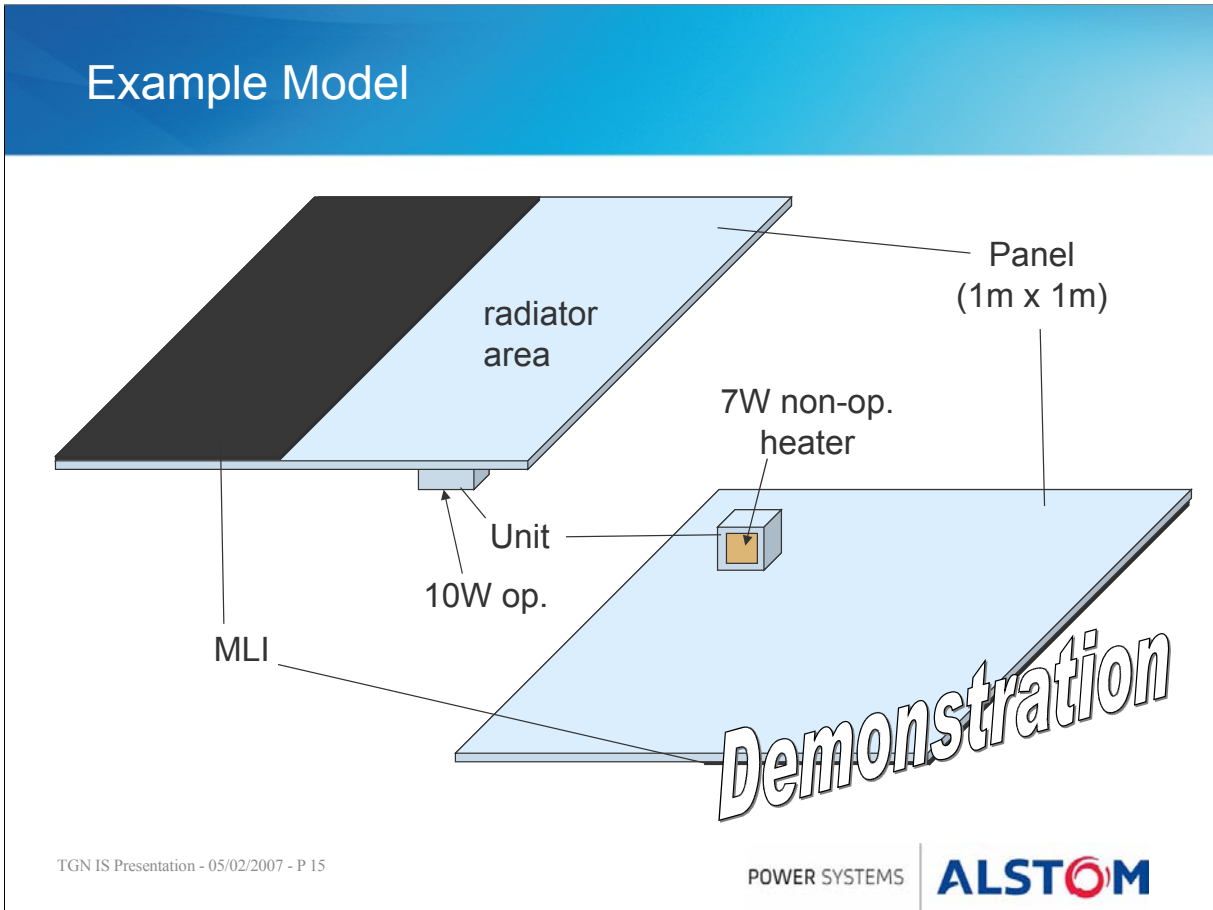
Automatic translation
Of STEP AP203



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