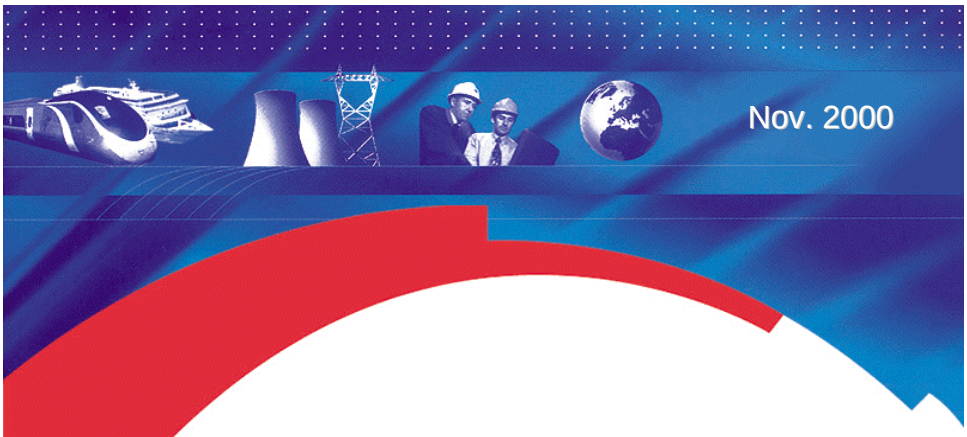
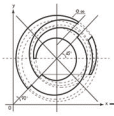


ESARAD v4.2

N J Stock

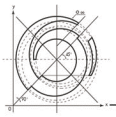
ALSTOM



ESARAD 4.1

ALSTOM

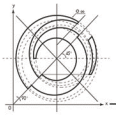
- Released June 1999
- Significant problems
- Why?
  - ORACLE replaced by file based storage
  - Completely new GUI (new technology)
    - Very ambitious
  - Scalability



ESARAD 4.2

ALSTOM

- Development plan discussed and agreed June 2000
- Principal aim to produce a robust tool
- Target date for delivery to ESA - the workshop



Program of work

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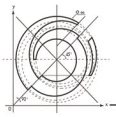
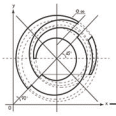
- General code quality
- Bug fixes
- Kernel / reporting memory use
- ESATAN file formatting
- 2 degrees of freedom pointing
- Reference manual

- NB - No effort allocated in plan specifically to GUI, but significant work has been done



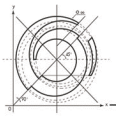
Code Quality & Bug Fixes

- Numerous bug fixes have been performed throughout the code
- More generic code mods. have been undertaken aimed at increasing the reliability of the underlying code
- Memory allocation
  - ESARAD whilst improved, remains memory hungry
  - With large models some machines may run out of memory
  - ESARAD 4.2 will report this



ESATAN File Formatting

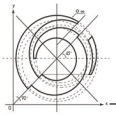
- Rewrite of core section of file formatting
  - significantly less memory hungry, but large models with many orbit positions will still be expensive
  - faster - in some cases much faster
- Node merging and in particular submodel definition
  - reliable
  - better error checking
- Improved GR culling



GR Culling

ALSTOM

- minimum
  - operates reliably as per reference manual
- deviation
  - time dependent GR's
  - if all values of a GR are sufficiently close to the average , then the average will be used and no array or interpolation will be output for that GR

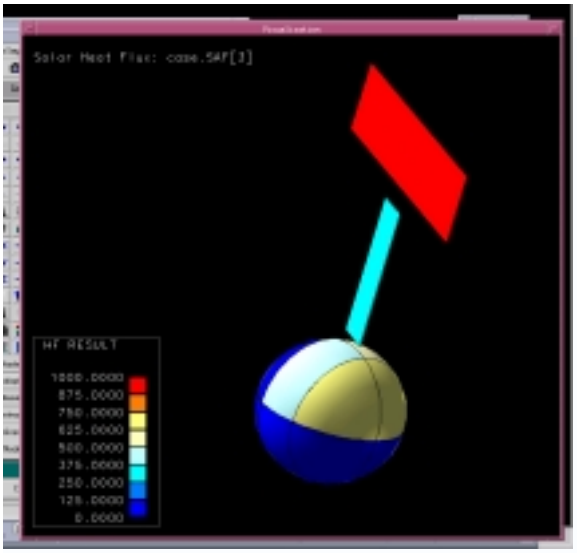


2 Degrees of Freedom Pointing

ALSTOM

- New "orientation" of 2DOF_CHAINED
- Moving component must be an assembly
- 2DOF_CHAINED assembly oriented to achieve desired pointing of the moving component assembly
- Calculation procedure
  - point the parent first and then the child
  - point the child first and then the parent
  - use the option which gives the best alignment of the child component

2-DOF Pointing - definition



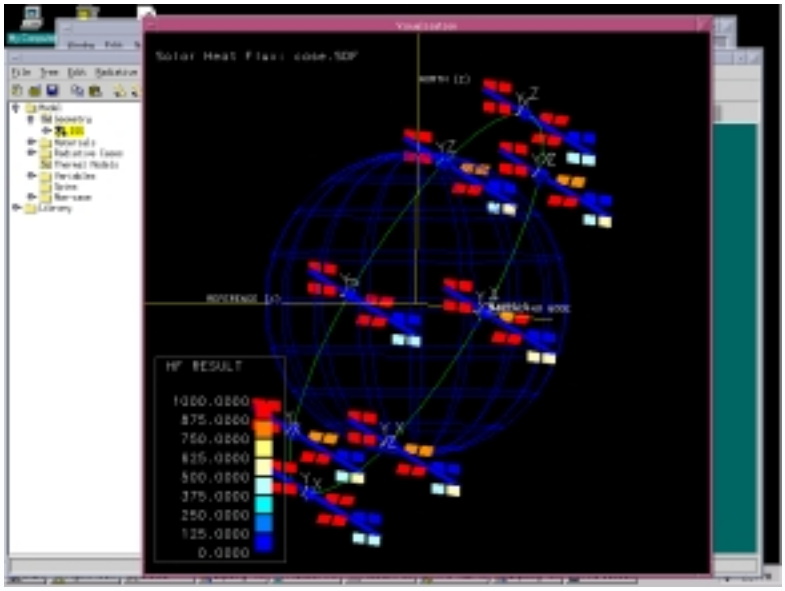

```
assbly1 = ASSEMBLE(
ref_comp = arm1,
moving_comp = Panel,
orientation =
"SUN_ORIENTED");

ass_test = ASSEMBLE(
ref_comp = Body,
moving_comp = assbly1,
orientation =
"2DOF_CHAINED",
rot_axis =
[0.0,1.0,0.0]);
```

True Sun Pointing

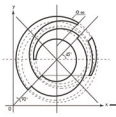
- Existing SUN_ORIENTED points along the reference line, requires user definition of Euler angles to match solar declination angle
- Introduced orientation of TRUE_SUN_ORIENTED, takes into account solar declination angle

2 DOF with True Sun Pointing



GUI

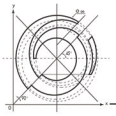
- Not the main priority for this work
- Large number of detail bugs fixed
- GUI is stable and robust
- Visualisation is not stable enough and not robust enough on Unix
  - inherent to using Java with GPHIGS
  - visualisation cannot be supported on HPUX 11 or Solaris 8
  - need to move to OpenGL
- Be patient when using Visualisation!



New Utilities

ALSTOM

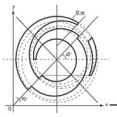
- TOPIC
- ARTEFIS
- exp3to2
  - on PC ESARAD outputs numbers with 3 digit exponents (e.g., 1.524E-003)
  - ESATAN requires 2 digit exponents (e.g., 1.524E-03)



Summary

ALSTOM

- ESARAD v4.2 batch processes are stable and robust
- ESATAN file formatting significantly improved
- 2 dof and true sun pointing introduced
- Basic GUI stable and robust, visualisation is not stable enough on UNIX
- Work continues to improve quality and capability in tandem



Current Position

ALSTOM

- Batch processes delivered to ESA and Astrium, Friedrichshafen on 30th October
- GUI to be delivered to ESA and Astrium, Friedrichshafen on 7th November
- ESARAD v4.2 to be released to industry in December 2000.