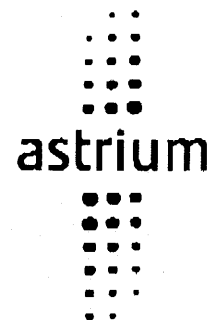


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Betreff/Subj.: Reduced H-EPLM Thermal Model Corrections

Dear Colleagues,

As already sent by email, this is to inform you about some corrective measures to be adopted for the Reduced H-EPLM Thermal Mathematical Model, Issue 1, distributed via e-mail on 24.07.02. These measures take into account numerical instabilities and summation problems when performing transient timeline calculations.

Measure 1 / numerical instability

The function HTRANS (defined in eplmntm.d, \$SUBROUTINES) results for some pipe wall-He couplings in large values above 1.E7 W/K, creating sort of boundary pipe wall nodes. To avoid this, the exponent within this function needs to be limited to a reasonable value.

Please replace line 1820 of eplmntm.d:

```
HTRANS = MASSFL * CPHEC * ( EXP (ALPHA*PIII*DIAMI*LPIPE/ (MASSFL*CPHEC)) - 1.DO )
```

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by the following lines:

```
XPON = ALPHA*PIII*DIAMI*LPIPE/(MASSFL*CPHEC)
XPON = MIN(XPON, 6.083D0)
HTRANS = MASSFL * CPHEC * ( EXP(XPON) - 1.D0 )
```

Measure 2 / summation problem in transient orbit mode

Within the orbit timeline program part (defined in herscred.d, \$EXECUTION) a sequence of different dissipation modes is called. To avoid some carry-over of dissipation values e. g. from mode 1 to mode 3, all dissipation needs to be set to zero right before the next mode is called.

Please introduce the following lines in herscred.d:

Line 230 (before mode 1 is called the first time):

```
# Reset all dissipation values to zero:
DO 10000, II = 0, NODES-1
QI99998(II)=0.
10000 CONTINUE
```

Line 282 (before mode 3 is called the first time):

```
# Reset all dissipation values to zero:
DO 10010, II = 0, NODES-1
QI99998(II)=0.
10010 CONTINUE
```

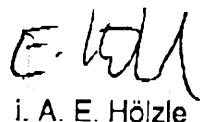
Line 313 (before mode 5 is called the first time):

```
# Reset all dissipation values to zero:
DO 10020, II = 0, NODES-1
QI99998(II)=0.
10020 CONTINUE
```

Kind regards

Astrium GmbH


i. V. K. Moritz


i. A. E. Hölzle