

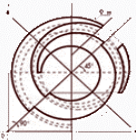
October 2002

# ALSTOM

## ESATAN v8.7 & 8.8

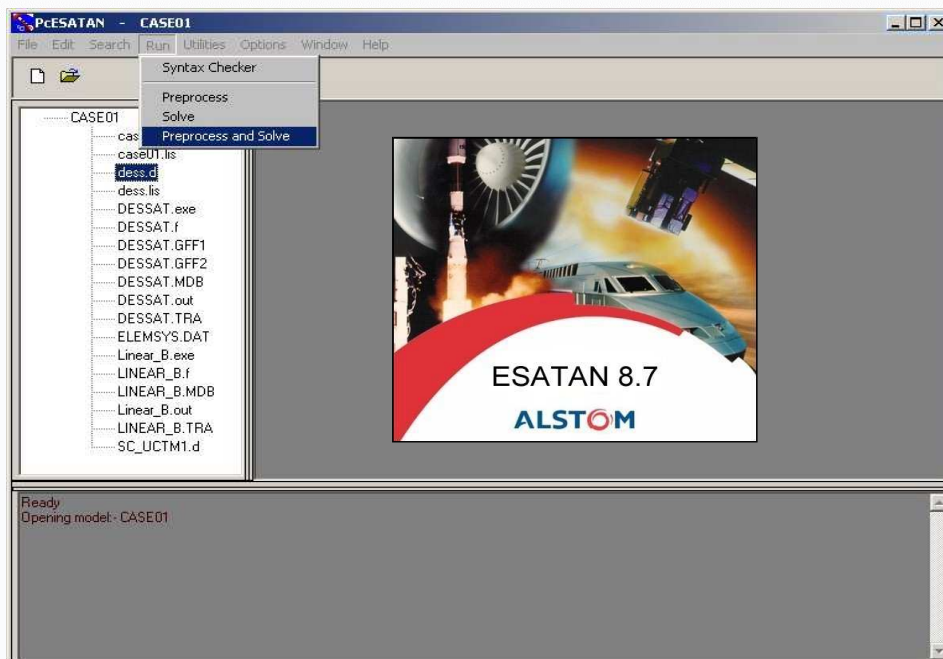
Julian Thomas  
Frédéric du Laurens d'Oiselay

**ALSTOM**

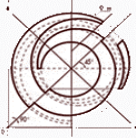


### ESATAN v-8.7

**ALSTOM**

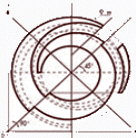


- State in the Field -



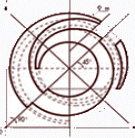
- ESATAN v-8.7
  - Released in December 2001
  - Free FLEXIm keys were provided upon request to cover model migration until end of June 2002
- Model migration now officially over
  - Old authorisation files obsolete
  - FLEXIm keys in full operation

- State in the Field -



- Apostrophe sign ['] in comments
  - Not allowed in this version
  - Patch available upon request
- To comment the **\$INCLUDE**
  - # **\$INCLUDE** and not #**\$INCLUDE**
- External subroutine
  - Subroutine in **\$EXTERNAL** model not recognised
- Beware of reserved names in ESATAN
- Missing substitution data in predefined elements not tested
- All these issues will be fixed in next version...

- Known Issues -



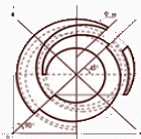
- Pre-Processor Improvements
- Fast Solvers
- Heat balance convergence
- Neutral output format (csv) for any data
- User constants defined any user "Mortran"
- Model name functions
- Node number functions (internal<->external)
- User documentation
- DTMAX treatment

- Continuing Commitment to Development -



- Pre-Processor Improvements
- **Fast Solvers**
- Heat balance convergence
- Neutral output format (csv) for any data
- User constants defined any user "Mortran"
- Model name function
- Node number functions (internal<->external)
- User documentation
- DTMAX treatment

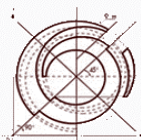
- Continuing Commitment to Development -



### Fast, Scaleable Steady-State Solution

- Improved band-width optimisation
- Proprietary algorithm development
- 'Detached node' support
- Improved energy balance (c.f. SOLVIT)
- Near linear scalability
- Examples from test suite:
  - 30,000 nodes/50,000 GLs/150,000 GRs - 7sec
  - 3,000 nodes/6,000 GLs/800,000 GRs - 24sec

- SOLVFM Recommended Steady-State Solver -

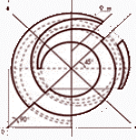


### Transient

- Unique "Rate of change" based dynamic time-stepping optimisation
- Arithmetic node optimisation
- Consistency of temperature dependant data
- Prototype up to 25 times faster for some models

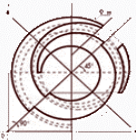
- Class Leading Transient Solution -





- Pre-Processor Improvements
- Fast Solvers
- **Heat balance convergence**
- Neutral output format (csv) for any data
- User constants defined any user "Mortran"
- Model name function
- Node number functions (internal<->external)
- User documentation
- DTMAX treatment

- Continuing Commitment to Development -



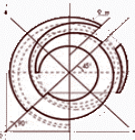
- Extension of heat balance control constants to thermal steady-state routines
  - INBALA (absolute energy balance) vs ENBALA
  - INBALR (relative energy balance) vs ENBALR
- Supported in both SOLVIT and SOLVFM

- Increased Analysis Control -



- Pre-Processor Improvements
- Fast Solvers
- Heat balance convergence
- **Neutral output format (csv) for any data**
- User constants defined any user "Mortran"
- Model name function
- Node number functions (internal<->external)
- User documentation
- DTMAX treatment

- Continuing Commitment to Development -



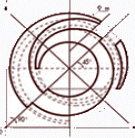
**CSV = Comma Separated Value**

- New library function for outputting to Comma Separated Value

```
PRNCSV ( ZLABEL , ZENTS , CNAME , OUTFOR , FILECS ) ;
```

- ZLABEL, ZENTS and CNAME have normal meaning
- OUTFOR defines grouping by node or data type
- FILECS defines output stream number

- Plotting, Archiving, Database Import, etc. -



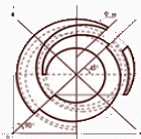
- Pre-Processor Improvements
- Fast Solvers
- Heat balance convergence
- Neutral output format (csv) for any data.
- User constants defined any user "Mortran".
- Model name function
- Node number functions (internal<->external)
- User documentation
- DTMAX treatment

- Continuing Commitment to Development -



- SUBMOD() - return name of current model
- SUBMDN(*nodei*) - return name of model containing internal node reference *nodei*
- NODNUM(*nodei*) - return user node number of internal node number *nodei*
- ?INTNOD(*cname*, *nodei*) - return internal node number of user node *nodei* in model *cname*

- Increased Modelling Flexibility -



- Fast solution in both steady-state and transient
- Heat balance convergence
- New neutral output (csv) routine
- User constants defined by other constants, etc.
- Model & Node number function



- Available Soon -

The ALSTOM logo, consisting of the word "ALSTOM" in a bold, blue, sans-serif font, with a red circle containing a white dot in the center of the letter "O".

[www.alstom.com](http://www.alstom.com)