



THERMIC SIMULATION et RECHERCHE

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ESACAP

ESACAP is a simulation program for non-linear dynamic systems. The first version was developed for the European Space Agency in 1979 by P.Stangerup, now managing director of StanSim Research, and S.Skelboe, now Professor in computer science at the University of Copenhagen. The contract undertaken by the danish company ElektronikCentralen was a result of a strong need for an interdisciplinary simulation tool. Typically, one problem was to analyse an electronic system in a thermal environment.

Therefore, the description language of ESACAP is very powerful as it was actually born with facilities that only much later became known as behavioural modelling.

ESACAP carries out analyses in DC using a combined gradient-Newton method. Time domain analysis is implemented as backward differentiation with variable step and order. In the time domain, a possible periodic steady state solution is accelerated by an extrapolation method: the Epsilon algorithm. S.Skelboe received the IEEE best paper award in 1980 for a paper about this algorithm. ESACAP also carries out frequency-domain analyses on linear or linearized systems and provides transfer functions vs. frequency as well as group delay and poles/zeros.

Sensitivities with respect to any describing parameter is available in all analysis modes.

The implementation of the ESACAP language carries partial derivatives through all elementary operations (today known as automatic differentiation). Therefore the ESACAP language provides exact derivatives for Jacobian evaluation and sensitivities.

ESACAP is operational on PC Windows 95/98/2000/NT/XP, UNIX-workstations and Cray.

Further information about ESACAP and other StanSim products is available from

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