

Panel Discussion on Multi-Disciplinary Analysis

Moderated by

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The Marshall Space Flight Center (MSFC) is hosting the Thermal and Fluids Analysis Workshop (TFAWS) during the week of September 10, 2001. Included in this year's TFAWS is a panel session on Multidisciplinary Analysis techniques. A description of that session is available below. The intent is to provide an opportunity for the users to gain information as to what product may be best suited for their applications environment and to provide feedback to you, the developers, on future desired developments.

Potential users of multidisciplinary analysis (MDA) techniques are often overwhelmed by the number of choices available to them via commercial products and by the pace of new developments in this area. The purpose of this panel session is to provide a forum wherein MDA tools available and under development can be discussed, compared, and contrasted. The intent of this panel is to provide the end-user with the information necessary to make educated decisions on how to proceed with selecting their MDA tool. It is anticipated that the discussions this year will focus on MDA techniques that couple discipline codes or algorithms (as opposed to monolithic, unified MDA approaches). The MDA developers will be asked to prepare a product overview presentation addressing specific questions provided by the panel organizers. The purpose of these questions will be to establish the method employed by the particular MDA technique for communication between the discipline codes, to establish the similarities and differences amongst the various approaches, and to establish the range of experience and applications for each particular MDA approach. The following approaches are on the agenda:

1. NPSS from NASA Glenn Research Center (Karl Owen)
2. MDICE from CFD Research (Vincent Harrand)
3. RECIPE from ISSI (Jerry Wittenstein, Troy Stanley)
4. iMAN from UGS (James (Nick) Nicholson)
5. iSIGHT from Engineous (Mark Prow, JP Evans)
6. RDCS from Boeing-Rocketdyne (Bill Follett)
7. LOCI from Mississippi State University (Ed Luke)

After the presentations by the MDA developers, there will be a discussion period that will include audience participation. The panel discussion will be moderated by Roberto Garcia, Georg Siebes, and Bruce Tiller from NASA. The presenters are requested to address the following points, not necessarily in this order, in their presentations:

- 1) In what aspect of the MDA process is your tool focused? For example, life cycle workflow management vs. analysis data exchange; level of fidelity (1D, 2D, or 3D); component vs. subsystem vs. system
- 2) Describe how your approach couples dissimilar discipline codes. For example, fine grain vs. coarse grain coupling; one way vs. two way communication amongst the disciplines; etc.
- 3) Distinguish current (operational) capabilities vs. future planned capabilities. Highlight how these capabilities are being used operationally.
- 4) Do you provide discipline specific modules or are you instead focused on the integration and coupling functions in the design and analysis process?
- 5) Does your approach include utilities to facilitate the coupling of legacy or third party codes?

- 6) Does the approach include any knowledge capture (expert system) or optimization capability? If so, describe these capabilities.
- 7) Does your product have the capability to run parallel jobs and/or make use of parallelization capability within the discipline codes?
- 8) Does your approach currently support linking directly with CAD? If so, to which packages?
- 9) Does your approach support coupling between analysis tools of varying levels of fidelity? For example, coupling of 1D analysis to 2D or 3D analysis.
- 10) Does your approach support time accurate MDA?
- 11) To what platforms has your method been ported?
- 12) Please provide a list of third party codes, discipline based codes that have been successfully run under your framework.