KNOWLEDGE CAPTURE FOR MULTIDISCIPLINARY STOP ANALYSIS

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ABSTRACT

Over the past several years, NASA Langley Research Center has been using the Comet software package to enable knowledge capture for structural-thermal-optical-performance (STOP) analysis. The majority of this work has focused on component level analysis. An analysis template was developed for the interferometer subsystem of the High Spectral Resolution Lidar 2 (HSRL-2) aircraft lidar instrument. This template captured the required discipline expertise in one model, and enabled a larger design space to be analysed more rapidly than would have been possible with a traditional analysis approach. For one subset of trade studies, it is estimated that total analysis time for the required trade studies was reduced from 5 weeks to 2 weeks. In addition, these analyses were completed by one engineer, and the time included documentation. While this method does not eliminate the need for discipline experts to review the solutions, it greatly reduces the overall time needed to complete the study because it allows for sequential, multidisciplinary analysis to be completed by a single engineer, on a single computer. The template developed for the HSRL interferometer is very specific for this component. A generic STOP analysis template is currently in development that will extend the analysis efficiency to a wide range of complete optical systems. These systems may include multiple optical components, which is typical of complex remote sensing instruments. By capturing the discipline expertise, general analyses, outputs, and requirements that are typical of these systems, the amount of analysis effort required for each subsequent system can be greatly reduced. This presentation will

demonstrate some of the knowledge capture work that has been done to date with component level analysis, and will provide a short overview of the current development work being done for complete optical systems.