**Computational Modeling Algorithms and Cyberinfrastructure**

**EVALUATION of**
**PROPOSAL SUBMITTED IN RESPONSE TO NRA: NNH11ZDA001N-CMAC**

**PI: Lee, Seungwon**

**Institution: Jet Propulsion Laboratory**

**Proposal No.: 11-CMAC11-0008**

**Title: Parallel Web-Service Climate Model Diagnostic Analyzer**

## BRIEF SUMMARY OF RESEARCH OBJECTIVES:

The research objective of this proposal is to develop a physics-based multi-variable performance evaluation and diagnostic information system Parallel Web-Service Climate Model Diagnostic Analyzer (PAWS-CMDA) that allows the use of multiple observational data, reanalysis data and model outputs. PAWS-CMDA is a framework that combines a number of scientific tools for data preparation and data analysis. The framework will execute in a parallel distributed environment and will be accessed by web services using two interfaces (web-based and an API). Practical applications of both the data preparation and data analysis systems will be completed to show the "real life" application of the system.

## BRIEF SUMMARY OF OVERALL EVALUATION:

The proposal has outlined a complex and large project which has significant technical merits, relevance and impact to the modeling community. PAWS-CMDA would make existing model and data analysis tools more efficient, and allow better model verification and validation. The work plan seems feasible and ambitious, with a well qualified team to carry out the goals of the proposal.

## INDIVIDUAL CRITERIA FINDINGS

### Intrinsic Merit

*Intrinsic Merit: Evaluation of intrinsic merit includes consideration of the following factors based on what is presented in the proposal: 1. The overall scientific or technical merit of the proposal and/or unique and innovative methods, approaches, concepts, or advanced technologies. 2. Offeror's capabilities, related experience, facilities, techniques, or unique combination of these that are integral factors for achieving the proposal's objectives. 3. Qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical to achieving the proposal objectives. 4. The overall standing of the proposal against the state of the art.*

**Strengths:**

The proposal has high technical merit with innovative approaches in improving model characterization, evaluation and diagnostics.

The team has been involved in many of the data preparation and data analysis technologies that are to comprise the PAWS-CMDA system, and as such are highly qualified to undertake this effort. They seem well aware of the issues they will be facing and how to tackle them, both from a scientific and computational point of view.

The dual interface (web browser and API) to access the framework allows for multiple uses of the system. The API allows for intense usage programmatically while the web browser allows the user to execute quick experimental runs.

**Weaknesses:**

The proposal does not mention the use of version control, unit tests, regression testing or the creation of supporting documentation all of which are important to successful software products.

**Relevance to NASA Computational Modeling Algorithm and Cyber-Infrastructure Program**

*Relevance to NASA Computational Modeling Algorithm and Cyber-Infrastructure Program The proposal only needs to demonstrate relevance by discussing how the proposed investigation addresses the goals and objectives of the specific program element. If it does so then it is, by definition, relevant to NASA.*

**Strengths:**

The proposal is highly relevant to NASA's CMAC program in addressing most elements within 'Computational model and analysis Algorithms' and specifically responds to the development of a model output analysis system based on an open source parallel Python - in a distributed parallel computing environment.

**Weaknesses:**

**Realistic/Reasonable Cost**

*Realistic/Reasonable Cost Evaluation of the cost realism and reasonableness addresses whether the proposed level of effort (i.e., labor FTEs) and the proposed other direct costs (i.e., supplies, equipment, travel) are commensurate with those required to accomplish the goals of the investigation. Salary levels, fringe benefit rates, and overhead rates are not part of that evaluation. NASA civil servants are not permitted to display costs of salaries and benefits. Do not assess cost weaknesses for proposals on the basis of missing CS salaries. Low cost, while desirable, does not offset the importance of realism and reasonableness of the proposed budget.*

**Strengths:**

The proposed level of effort for accomplishing the goals of the project is reasonable, although seemingly ambitious if it were not for the high caliber of the team undertaking this effort and existing legacy technology.

**Weaknesses:**

**Note from the Panel to the PI:**

**OVERALL RATING:**

**Rating (provide overall numeric score):**

**E=5 ___ E/VG=4.5 _4.2_ VG=4 ___ VG/G=3.5___ G=3 ___ G/F= 2.5 ___**
**F=2 ___ F/ P=1.5 ___ P=1 ___**