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Author: Dr. Peng Wang  
Equipment Academy, China, zbxysimon@hotmail.com

SERVICE ORIENTED DESIGN METHOD FOR SPACE ENVIRONMENT EFFECT MODEL BASE

**Abstract**

Space environment effect is the complex process of the interaction between spacecraft and environment. It is not only related to the space environment, but also with the spacecraft platform, track, payload performance parameters and so on. Space environment effect analysis model is an important foundation to study the influence of space environment and its influence on the spacecraft. At present, most of space environment effect analysis tools integrate spacecraft orbit calculation models, space environment models, the payload function calculation models and effect calculation models and so on. It makes space environment effect analysis model complexity, single applicability, lack of flexibility, not easy to extend and share. In this paper, based on the analysis of the existing model base architecture technology, taking space environmental effect analysis model sharing and reconstruction as the goal, a service oriented design method for space environment effect model base (SEEMB for short) is proposed. Four layer model architecture, which includes the basic resource service layer, the base model class library layer, the model service layer and the model running service bus, is constructed. Three different ways of model service development are studied. And the space environment effect analysis basic model class library and the service component base are designed and developed. The loosely-coupled mode of SEEMB makes it is simple and flexible for adding other space environment analysis modular into SEEMB by the way of services, and realize the plug and play of the model. And SEEMB provides the union service platform for many kinds of service demanding and applications, bridging the model service and the application system.