
Thermal Evaluation on Multi-Layer Insulation Modeling Using Thermal Analysis Program

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Most of the external surface of a satellite are covered with insulation material and radiating surfaces for proper thermal control. Among the insulation material, MLI (Multi-Layer Insulation) is widely used. For the thermal design and analysis on a satellite, the effect of MLI should not be underestimated. The effective optical property for MLI can be used for the efficient analysis when MLI can see the deep space direction. Otherwise, radiation exchanges between MLI surface and other satellite surface take place. Because exact thermal modeling on MLI is not realistic, several simplified approaches are used. Those are effective property, linear conductor between MLI and surface, etc. In this paper, those methods are compared and applied to test cases using thermal analysis program (Thermal Desktop/RadCAD/SINDA FLUINT). Besides, built-in functions in the program for the insulation modeling would be also compared.