STABLE AND FAST NUMERICAL SCHEMES FOR CONJUGATE HEAT TRANSFER

Marc Paul Errera[*][§], Florent Duchaine[**]
[*]ONERA - *The French Aerospace Lab* - 92322 Châtillon Cedex, France
[**]CERFACS - 42 Avenue Gaspard Coriolis, 31057 Toulouse Cedex 01, France.
[§]Correspondence author. Fax: +33 146734166 Email: marc.errera@onera.fr

ABSTRACT The goal of this paper is to present numerical stability properties of some conjugate heat transfer schemes on the basis of a coupled thermal model problem. A general Robin-Robin transmission procedure is considered. The expression of the amplification factor is provided for the model problem and optimal conditions are presented. Three specific transmission conditions are then taken into account and commented. The influence of the coupling parameter is illustrated from a temperature profile obtained at a fluid-solid interface in an aerothermal computation. It is shown that the so-called optimal coefficient provides the best results in terms of stability and convergence.