

**EXTENSION OF THE EXACT SLW MODEL TO  
NON-ISOTHERMAL GASEOUS MEDIA****Vladimir P. Solovjov\*, Denis Lemonnier\*\*, and Brent W. Webb\***

\*Brigham Young University, A-387 ASB, Provo, UT 84602, USA

\*\*ISAE-ENSMA, BP 40109, 86961 Futuroscope Chasseneuil Cedex, France

**ABSTRACT** The exact limit of the spectral line weighted-sum-of-gray-gases (SLW) model in isothermal media is extended to the case of non-isothermal media following the reference approach. The problem is thus expressed in terms of a continuously varying absorption cross-section in the limit as the number of gray gases tends to infinity. The limiting case of the SLW reference approach is developed for spectral integration of the RTE in non-isothermal environments. Analytical solutions of the Exact SLW model are obtained for a multilayer system of isothermal layers, and the analytical solutions for non-isothermal medium are obtained in the limit when the number of sublayers approaches infinity. The Exact SLW model is applied also for construction of the optimized efficient SLW-1 model consisting of a single gray gas and a single clear gas. The Exact SLW model is a theoretical approach which is useful for better understanding of the possibilities and limitations of the SLW method, but it also has implications for practical applications.