DEVELOPMENT OF A METHOD TO ESTIMATE PROFILES OF EQUIVALENT ABSORPTION COEFFICIENT FOR GRAY ANALYSIS

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ABSTRACT: Using inverse radiative property value analysis, profiles of gray equivalent absorption coefficient are estimated with results similar to nongray analysis when the coefficients are used in the corresponding gray analysis. For the inverse analysis, the results of nongray analysis are used as the input. An approximate method is proposed for the estimation of the profiles of equivalent absorption coefficients without previously knowing the results of nongray analysis. The profiles of the equivalent absorption coefficients obtained by the new method are compared with that estimated by the inverse analysis for two-dimensional model furnaces. The new method is shown to be useful in estimating the profile of absorption coefficients for gray analysis.