

عنوان مقاله:

A Semi-analytical Expression for the Prediction of the Velocity along the Centerline of Coaxial Turbulent Gaseous Jets

محل انتشار:

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خلاصه مقاله:

In many diffusion combustion systems, fuel and air enter the combustion chamber in the form of coaxial turbulent gaseous jets. Hence the behavior of these jets must be well understood prior to any detailed analysis of the corresponding combustion system. As a first step, velocity decay along the centerline of coaxial turbulent gaseous jets is studied in this work. A semi-analytical expression for the prediction of the centerline velocity in coaxial turbulent gaseous jets is proposed. The expression can be applied to all the regions of the jets. Least-squares curve-fits to computational fluid dynamics (CFD) solutions are used to set the constants in the expression. Results are compared with existing experimental and numerical data and reasonable agreement is observed. The suggested expression is also capable of predicting the velocity decay along the centerline of single round turbulent jets and yields results which are sufficiently accurate in most engineering applications very quickly

کلمات کلیدی:

Coaxial gaseous jet, Prediction formula, Velocity decay, Potential core length, Turbulent mixing, Diffusion combustion

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