Advanced Modeling of Thermal Plasmas for Industrial Applications VITTORIO COLOMBO, EMANUELE GHEDINI, C.I.R.A.M. and D.I.E.M., University of Bologna — Modeling results are presented for different industrial thermal plasma sources using a customized version of the commercial code FLUENT capable of 2D and 3D transient simulation with advanced CFD models that take into account turbulence effects using different approaches (Reynolds Stress Model and Large Eddy Simulation), transport of species and radiation (Discrete Ordinate Model with interaction between radiation and solid surfaces). Simulations results are presented in order to show the capabilities of this modeling tool, which is very useful for the design of a wide range of atmospheric pressure thermal plasmas devices and related assisted processes, such as: ICPTs with injection of powders for spheroidization, DC twin-torch transferred arc plasma systems for waste treatment, DC non-transferred arc torch for plasma spraying and DC transferred arc torch for high quality plasma cutting.

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