Abstract Submitted
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DNS of H_2/Air Combustion using Complex Chemistry JEFF DOOM, KRISHNAN MAHESH, University of Minnesota — Direct numerical simulation (DNS) is used to study reacting, laminar, vortex rings and turbulent diffusion flames. A novel, all–Mach number algorithm developed by Doom et al (*J. Comput. Phys.* 2007) is used. The chemical mechanism is a nine species, nineteen reaction mechanism for H_2 and Air from Mueller at el (*Int. J. Chem. Kinet.* 1999) and the extended Zel'dovich mechanism was used to account for the formation of NO. Simulations were performed for three dimensional vortex rings where diluted H_2 at ambient temperature (300 K) is injected into hot air (1200 K). The effect of Damkohler number and stroke length will be discussed. Simulations of a three dimensional turbulent diffusion flames were performed. Isotropic turbulence is superimposed on an unstrained diffusion flame where diluted H_2 at ambient temperature interacts with hot air. Results of the simulation will be discussed.

Jeff Doom
University of Minnesota

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