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Strain rate effects on soot evolution in turbulent nonpremixed flames JEFFRY K. LEW, MICHAEL E. MUELLER, Princeton University, SALEH MAHMOUD, ZEYAD T. ALWAHABI, BASSAM B. DALLY, GRAHAM J. NATHAN, The University of Adelaide — Large Eddy Simulations (LES) of turbulent nonpremixed ethylene/hydrogen/nitrogen (2/2/1 by volume) jet flames are conducted to investigate the effects of global strain rate on soot evolution. The exit strain rate is varied by fixing the Reynolds number as the burner diameter and exit velocity are altered. A detailed integrated LES approach is employed that includes a nonpremixed flamelet model that accounts for heat losses from radiation, a transport equation model to account for unsteadiness in polycyclic aromatic hydrocarbon (PAH) evolution, a detailed soot model based on the Hybrid Method of Moments [Mueller *et al.* Combust. Flame 156 (2009)], and a novel presumed subfilter PDF model for soot-turbulence interactions. As the strain rate increases, the maximum soot volume fraction decreases due to the suppression of PAH formation. This trend with increasing strain rate is validated against experimental measurements conducted at The University of Adelaide.

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