

Abstract Submitted  
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**On the Stability of Ionizing Shocks in Monatomic Gases**<sup>1</sup> HAI LE, ANN KARAGOZIAN, UCLA, MARCO PANESI, University of Illinois at Urbana-Champaign, JEAN-LUC CAMBIER, Air Force Research Laboratory — Prior work by our group demonstrates the use of a collisional-radiative model in reproducing the correct steady-state shock structure of ionizing shocks in monatomic gases.<sup>2</sup> In this presentation, we report on time dependent calculations of ionizing shock flows, which reveal additional physical phenomena arising from the unsteadiness and non-linear wave coupling between convection and kinetics. The observed phenomena are similar to instabilities often seen in gaseous detonations.<sup>3</sup> The present model also takes into account radiative heat losses and radiation transport, which result in a reduction in the shock velocity and precursor effects. The latter phenomena may be important at high shock velocities, and are being investigated in detail.

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<sup>2</sup>Le, H. P., et al., Bull. Am. Phys. Soc. **57**, 17 (2012)

<sup>3</sup>Cole, L. K., et al., Combust. Sci. Technol. **184**, 1502-1525 (2012)

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