

Colloquium Notice

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Drop formation following bursting of molten steel thick films in a steel plate irradiated by a high energy laser

This talk presents observations of the bursting of thick liquid films of molten steel following illumination of a thin vertical steel plate by a 1075-nm continuous-wave 1000W Ytterbium fiber. Molten steel formed in the illuminated region persists as a molten disk before a hole forms. Gravity is responsible for the formation of a dimple in the upper part of the molten disk and a bulge in the lower part. Images of the initial hole captured by a high-speed digital camera at room temperature conditions show that the hole enlargement is quite sudden, like a soap film popping. Following this, a single drop of molten forms and falls under the influence of gravity below the height of the laser beam, leaving behind a hole in the plate. Images of the initial hole captured by a high-speed digital camera show that the hole forms first in the top portion of the molten disk, not in the center.

The molten steel is modeled as liquid contained within a hoop with size of the final hole. 3D images produced by Surface Evolver, an interactive program for modelling liquid surfaces, indicate the presence of a dimple within the molten region near the location of first appearance of the hole, and a bulge in the molten region near the lower portion for a liquid with density and surface tension taking on values near the melting point of iron.

Wednesday
December 4, 2019
Starts at **12:15 pm**
Coffee at **12:00 pm**
SB B326