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Committee

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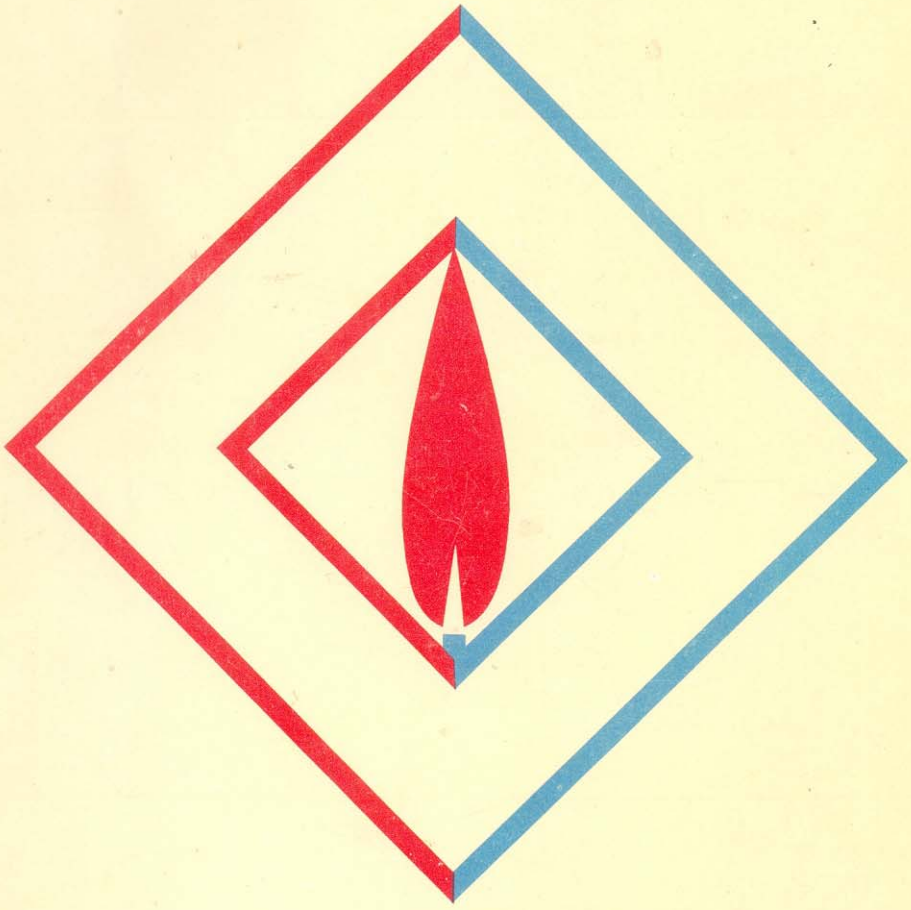

ABSTRACTS

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THERMAL DETONATION IN MOLTEN Sn-WATER SUSPENSION

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A violent large-scale interaction between molten tin and water is considered in the frame of a steady thermal detonation model. Based on experimental data a modified fragmentation mechanism is introduced into the model. This mechanism allows to take into account some time delay between lead shock arrival and the incipience of drop breakup in liquid-liquid systems.

A set of equations of a separated one-dimensional two-phase flow has been studied qualitatively and solved numerically. It is found that momentum losses due to friction at tube walls result in decreasing the detonation velocity and maximum overpressure in the system. It is also shown that within a certain range of wall surface roughness steady thermal detonation does not exist. The influence of the initial vapor content on detonation parameters is analized.

Particular analysis is undertaken to determine singularity conditions at the C-J plane. It appears that on the contrary to the ideal case certain difference of phase velocities is to take place when chocking condition is satisfied. This phenomenon is analogous to incomplete fuel burnout in the reaction zone of non-ideal chemical detonations.