Shock wave – boundary layer interaction driving DDT 青山学院大学理工学研究科 Edyta Dzieminska, 町田拓也

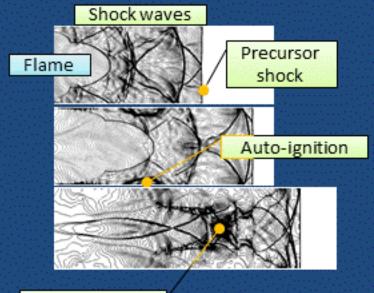
Purpose

The theme of this work is to show that the reason for an auto-ignition in the boundary layer that drives DDT in a smooth tube is shock wave – boundary layer interaction.

Results

Analysis seeks to demonstrate physics of the interaction in a matter of fluid dynamic and thermodynamic view. Shock waves which propagate between the precursor shock and the flame interact with the boundary layer heating it up one again. With the sufficient induction time one can observe an auto-ignition. From the process of the auto-ignition a new flame is developed and it propagates along the wall with more than local sound speed, which makes it a fast flame, and after flames collision triggers DDT in consequence.

利用した計算機 SX-9 CPU時間 22 時間 使用メモリ 24.768 GB ベクトル化率 99.67 % 並列化 4 並列



Flames collide