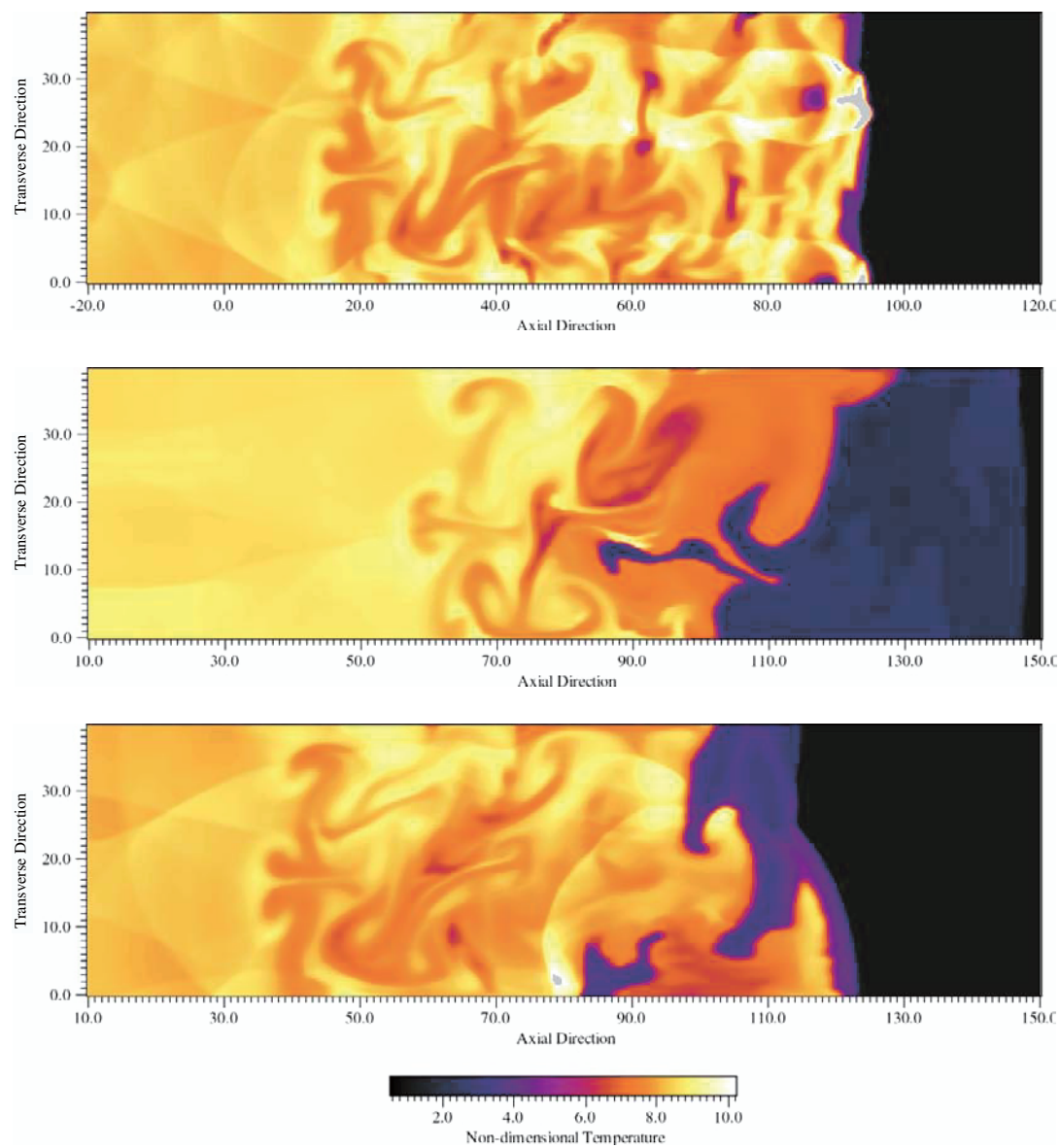


6. Numerical Visualization of Decaying Process of Oxyhydrogen Detonation Waves

Ohyagi, S.¹⁾, Kobayashi, Y.²⁾ and Obara, T.¹⁾

1) Saitama University, 225 Shimo-okubo, Urawa, Saitama 338-8570, Japan

2) Mitsubishi Heavy Industry Co.Ltd.



A detonation wave is a supersonic combustion wave. It consists of a shock wave and a reaction wave. A triple shock structure including triple-points of shock waves is a key structure, which defines the detonation wave. In this calculation, a decaying process of the gaseous detonation wave is simulated by the FCT scheme. Figures above show typical results for temperature fields of the waves propagating from left to right. Bright yellow region represents the high temperature burned gas region, dark blue region the shocked unburned gas and black region indicates the non-disturbed region (The gray region indicates that the temperature is higher than the upper limit of color bar). Top figure illustrates the quasi-steady Chapman-Jouguet detonation wave with three triple points on the front. The other two figures show the case in which the detonation waves are decaying due to a change of the mixture properties. In these cases, the flame fronts de-couple with the shock fronts and the triple shock structure disappears.