

1056-76-1537

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Shock Wave Formation on Turbulent Coanda Surfaces.

In the petroleum industry a procedure called flaring is used, which is the burning off of unwanted gas. Modern day flares use the Coanda effect, which states "when a jet of fluid is passed over a curved surface it bends to follow the surface entraining large amounts of air" to achieve smokeless combustion, increased combustion efficiency, and decreased thermal radiation due to the entrainment of large amounts of air. These advantages are at the cost of increased noise pollution, due to shock wave formation caused by the difference in the nozzle exit pressure and the ambient pressure. Sound called Shock-Associated Noise is generated by the interaction of downstream propagating turbulent eddies and the stationary quasi-periodic shock-cell structure contained in the supersonic jet. A model of Shock-Associated Noise near turbulent Coanda surfaces will be presented, and compared with experimental data along with suggestions for reducing noise. Also a visualization of these shock wave formations and their intricacies will be presented if time allows. (Received September 22, 2009)