



DESCRIPTION:

Pulse Detonation Engines (PDEs) show great promise as the aircraft engine of the future. Supersonic detonation waves burn fuel in a more efficient manner than is possible in standard jet engines. The engines are also extremely simple and lightweight, consisting of only a set of tubes. The simple geometry of PDEs belies their complexity. Timing and fuel-air mixtures must be precisely coordinated in order to create a detonation wave that travels down a tube. Smooth operation requires a rapid firing frequency, which increases the challenge further.

Martec Limited provides support for PDE modelling using its custom-built software to rapidly evaluate potential designs before building and running expensive experiments. Results from Martec's numerical simulations can streamline the PDE design process by decreasing the time and money required evaluate design modifications.

References:

1. P.G. Harris, S. Guzik, R. Farinaccio and R.A. Stowe, D.R. Whitehouse, T. Josey, D. Hawken and R.A. Link, A.J. Higgins, P.A. Thibault, "Comparative Evaluation of Performance Models of Pulse Detonation Engines", AIAA 2002-3912, 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, July 2002, Indianapolis, Indiana.
 2. J. Kelly, "After Combustion: Detonation!", Popular Science, September 2003, pp 50-58, 115.
 3. P.G. Harris, R.C. Ripley, S.M. Guzik, "Single-Tube Two-Dimensional Evaluation of a Pulse Detonation Engine as a Ramjet Replacement", 40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, July 2004, Ft. Lauderdale, Florida.
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