

DEFLAGRATION-TO-DETONATION TRANSITION
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Low detonability of jet propulsion kerosene in air is the key barrier for the progress in the development of air-breathing pulse detonation engines. In view of it, various approaches are currently under consideration, which are aimed at decreasing the detonation initiation energy and run-up distance and time of kerosene–air mixtures. In this paper, the possibility of deflagration-to-detonation transition (DDT) in partly prevaporized kerosene TS-1 (Russian analog of Jet A)–air mixture at normal atmospheric pressure in a heated (110–130 °C) tube 52 mm in diameter was demonstrated experimentally. The DDT was repeatedly detected with a run-up distance of 2 m and time of 5–6 ms at ignition energy as low as 5 J. The successful DDT became possible solely due to the application of the “Shchelkin spiral–tube coil” combination proposed by the authors and tested previously.