Micromachined Rocket Engines

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We are developing a micromachined rocket engine for a variety of applications including propulsion. The rocket is fabricated using a process that combines deep reactive ion etching (DRIE) of silicon with aligned wafer bonding. The initial microrocket was fabricated from a six-wafer silicon stack. The structure contains a rocket nozzle, propellant injectors, and micromachined cooling channels that surround the rocket chamber. The first devices have been fabricated and tested. Successful operation of the rocket has been demonstrated. New work is focused on; improvements of the mechanical strength of the rocket, development of a valve and turbopump for fuel delivery, and improvements in the packaging technology.

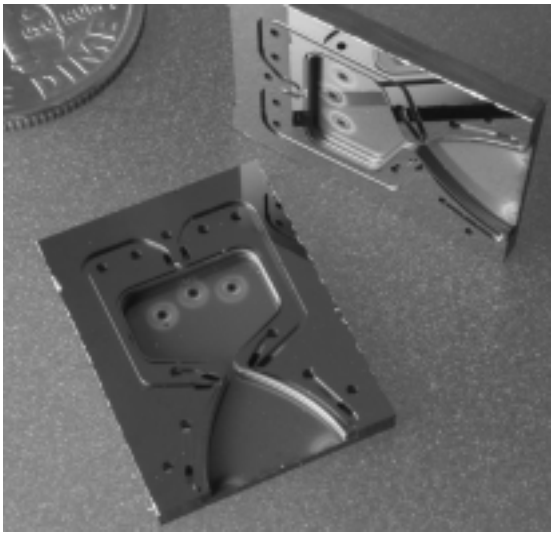

Fig. 50: A six wafer microrocket engine