POSTECH

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Development of 2.45 GHz Waveguide-based Air Torch System*

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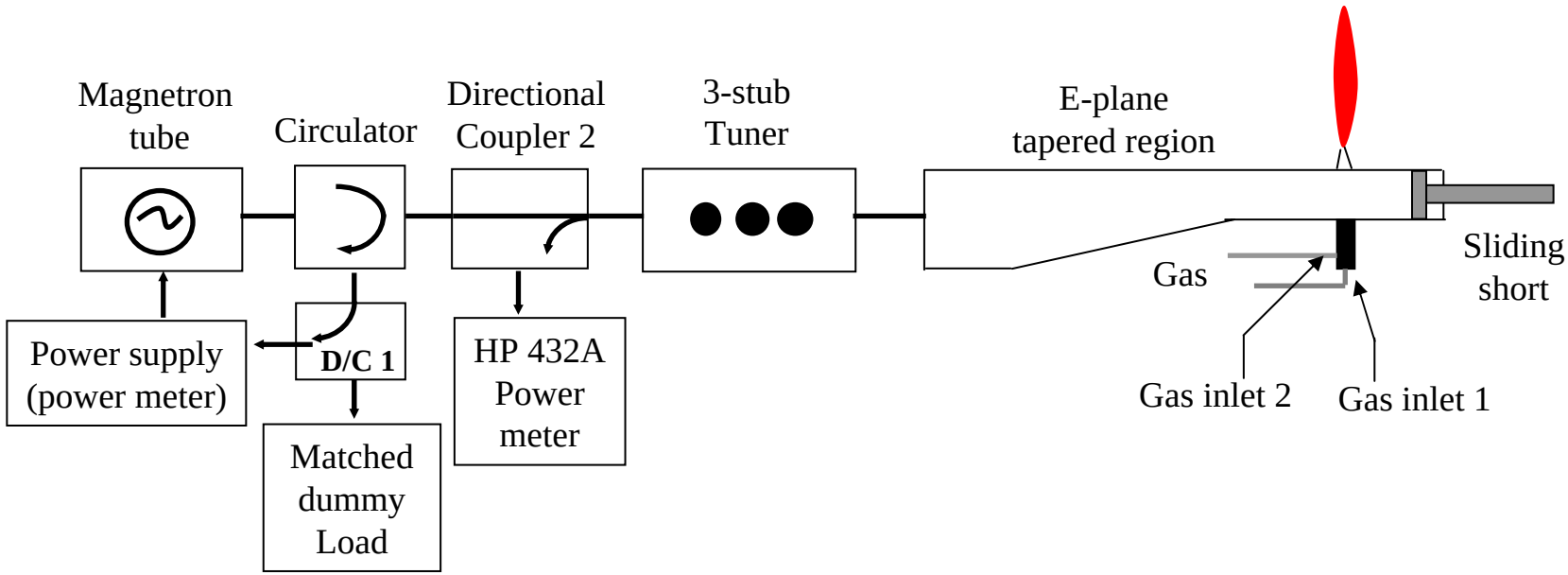
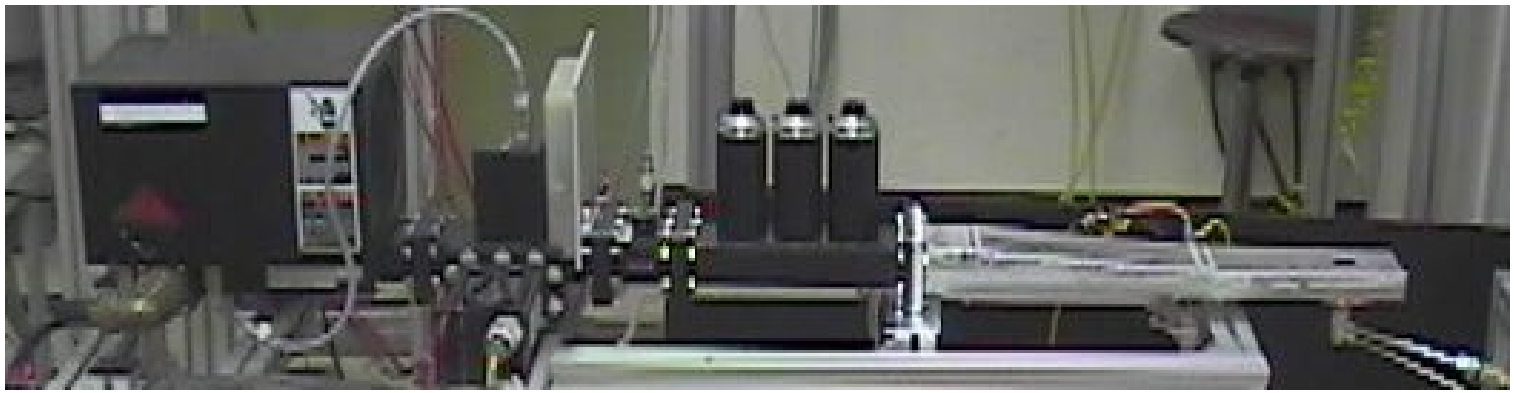
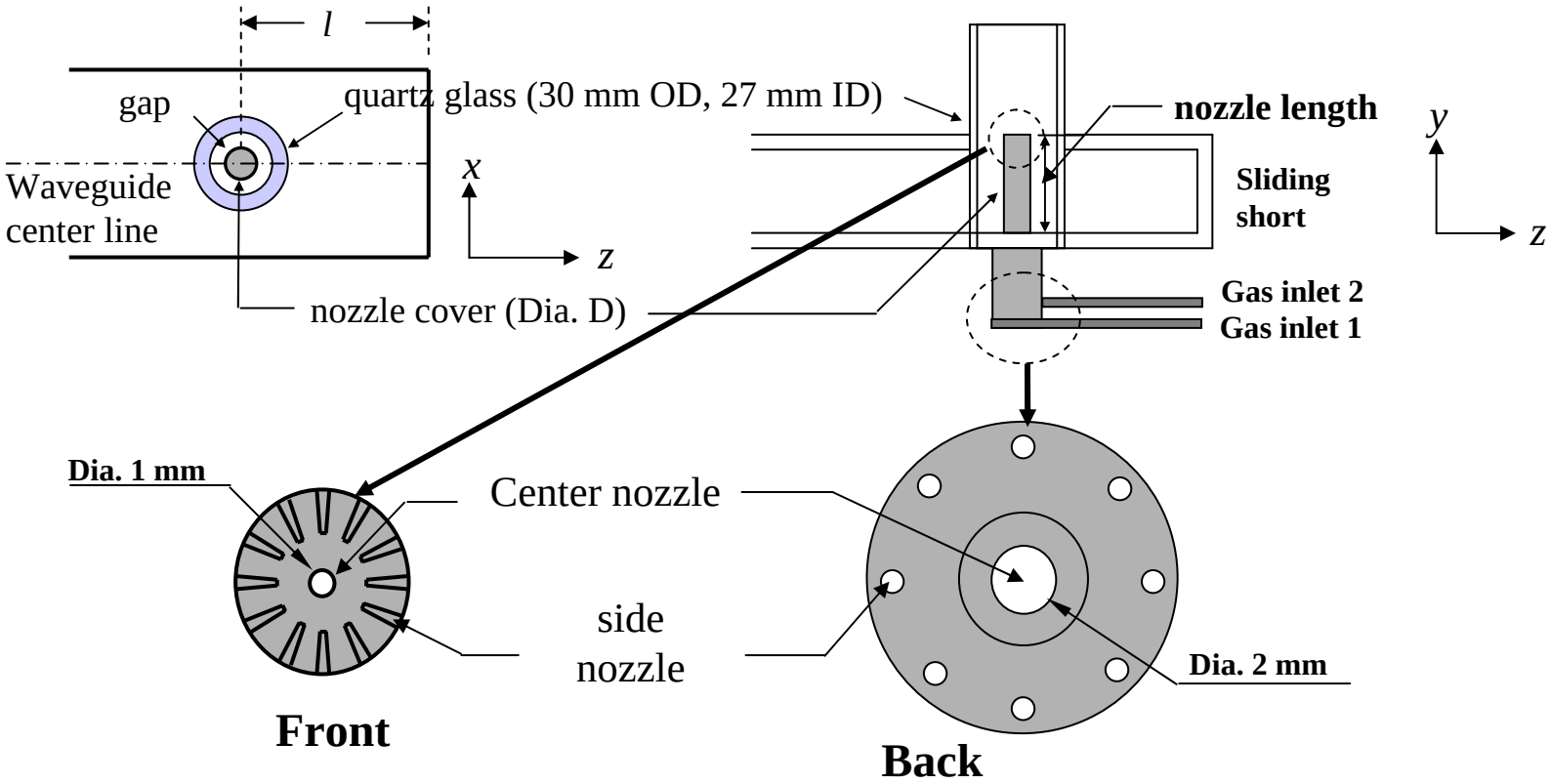
Schematic of the torch system

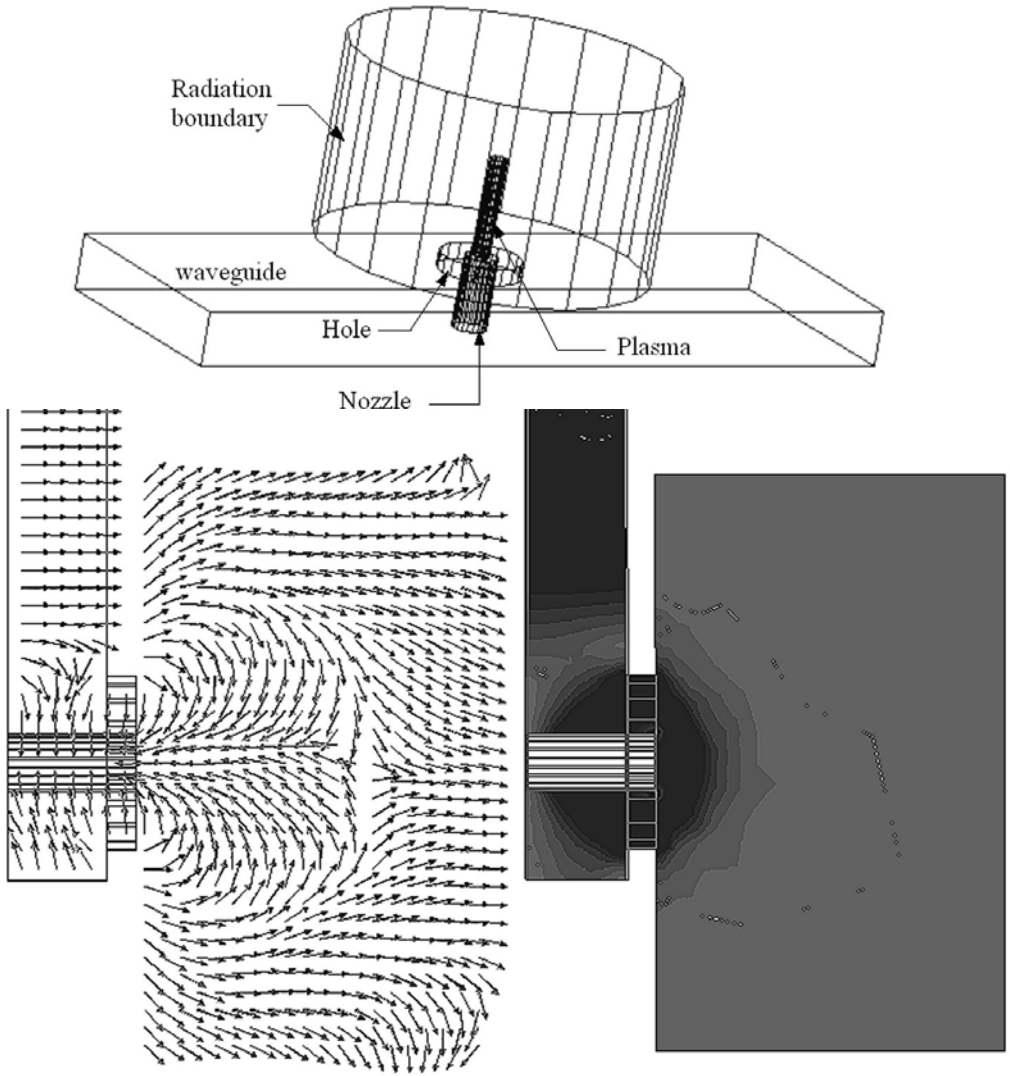




Nozzle structure (coaxial-like)



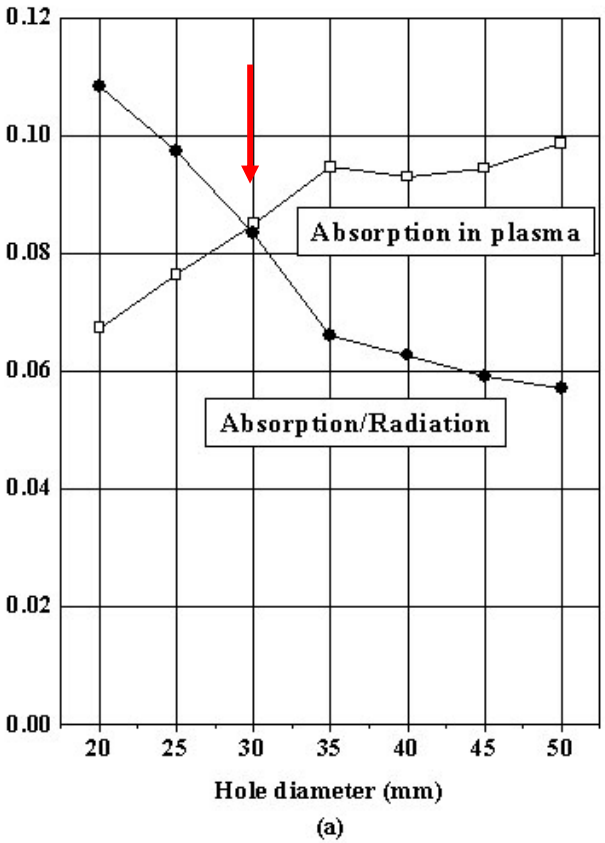
HFSS design

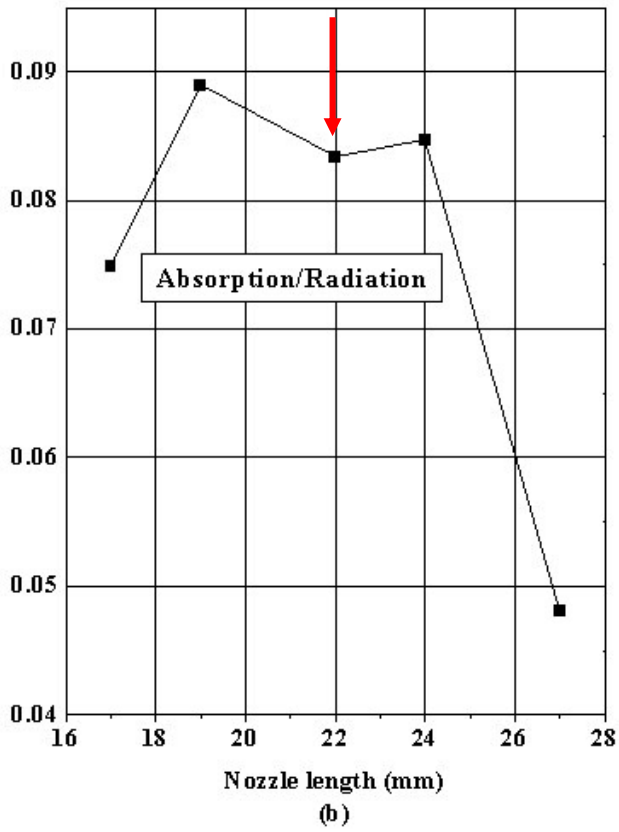


Hole diameter and nozzle length

$$P_{rad} = \int \left| \vec{E} \times \vec{B} \right| dS_{rad}$$

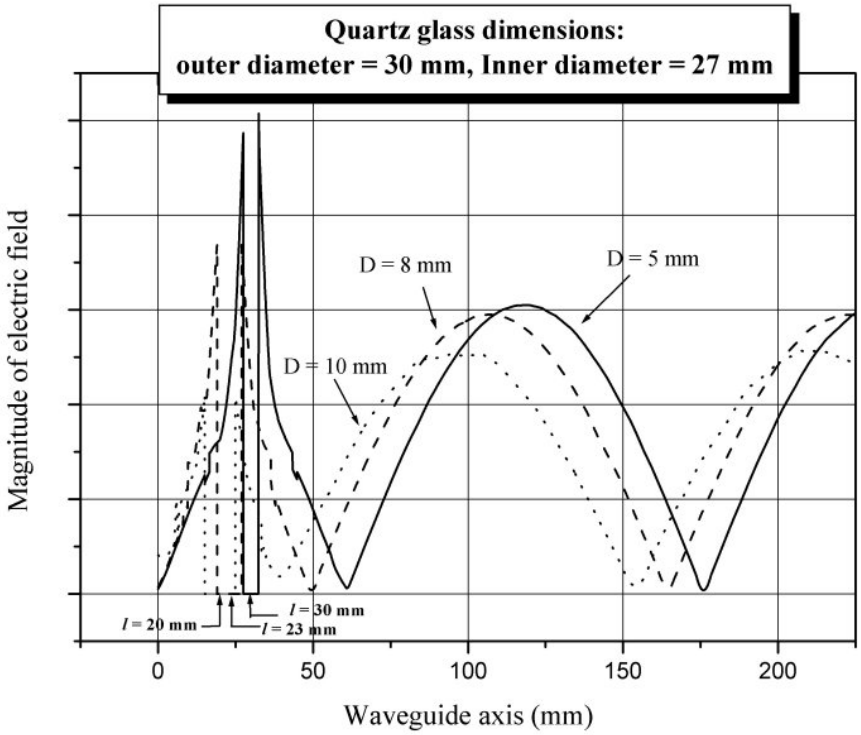
$$P_{abs} = \int \left(\left| \vec{J}_{vol} \right| \right)^2 dV_{plasma}.$$

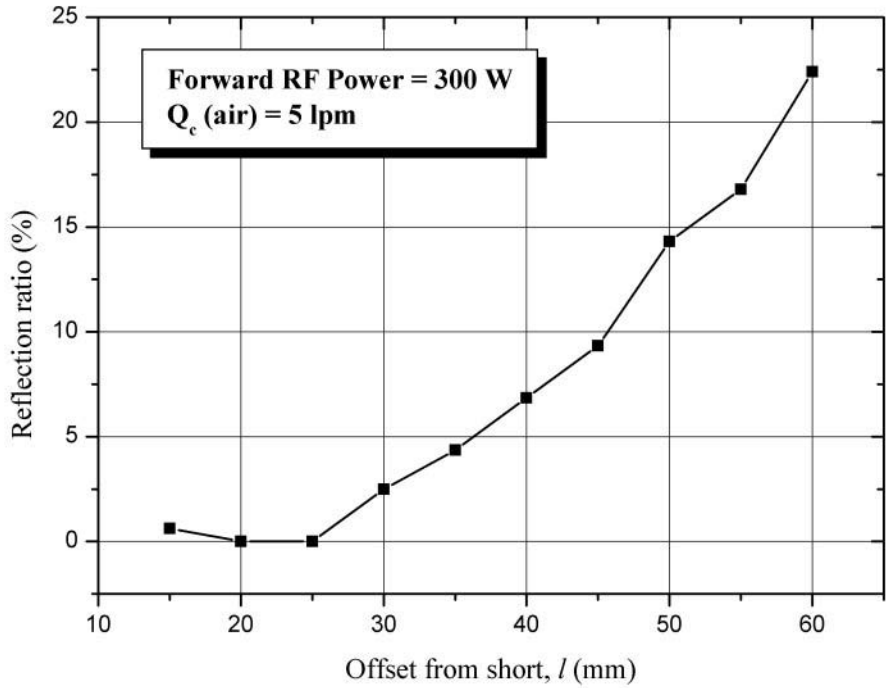




Short-plate positions

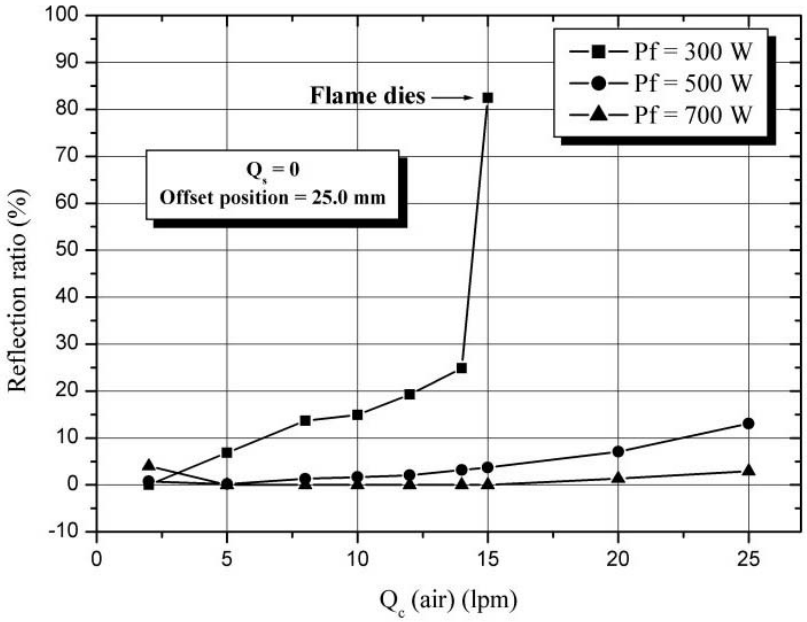
Design consideration: symmetrical electric-field distribution

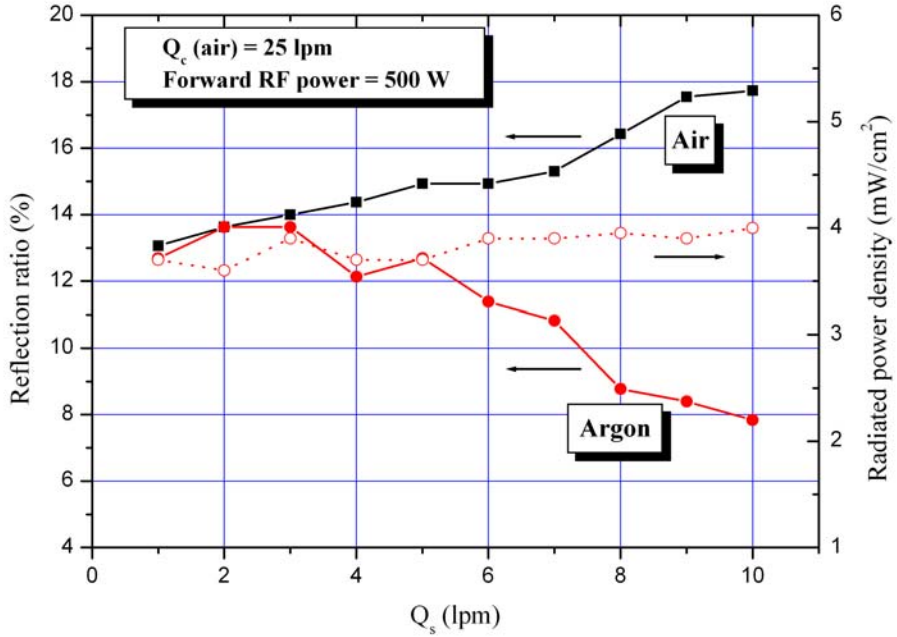




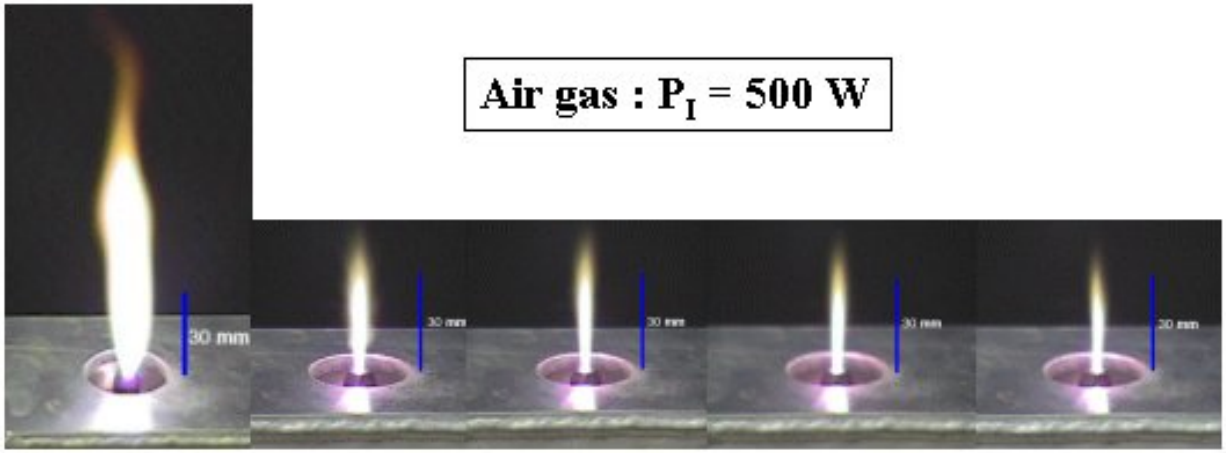
Experimental result

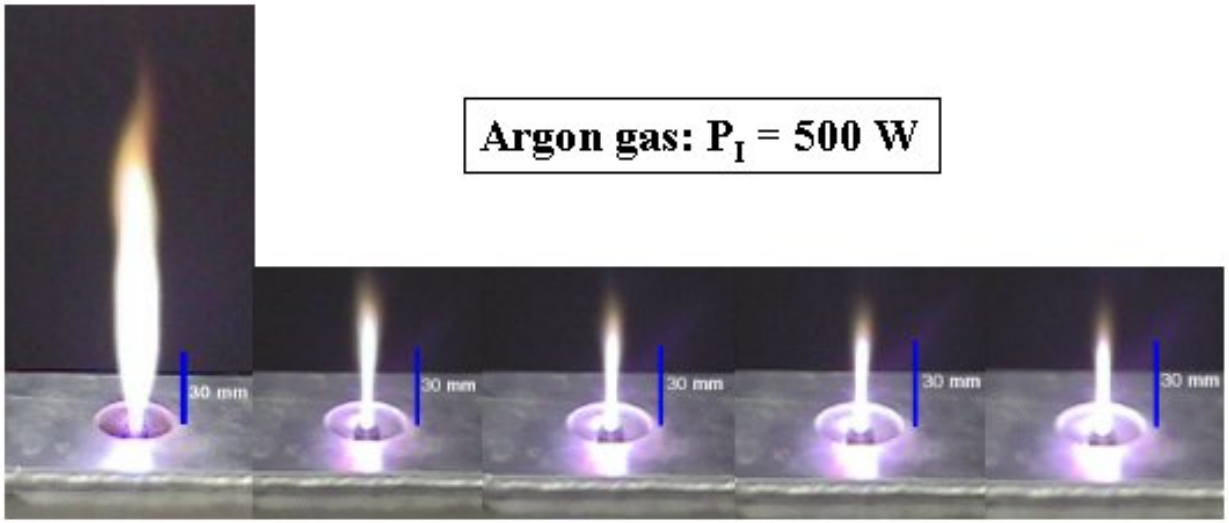
Power reflections vs. gas flow rates



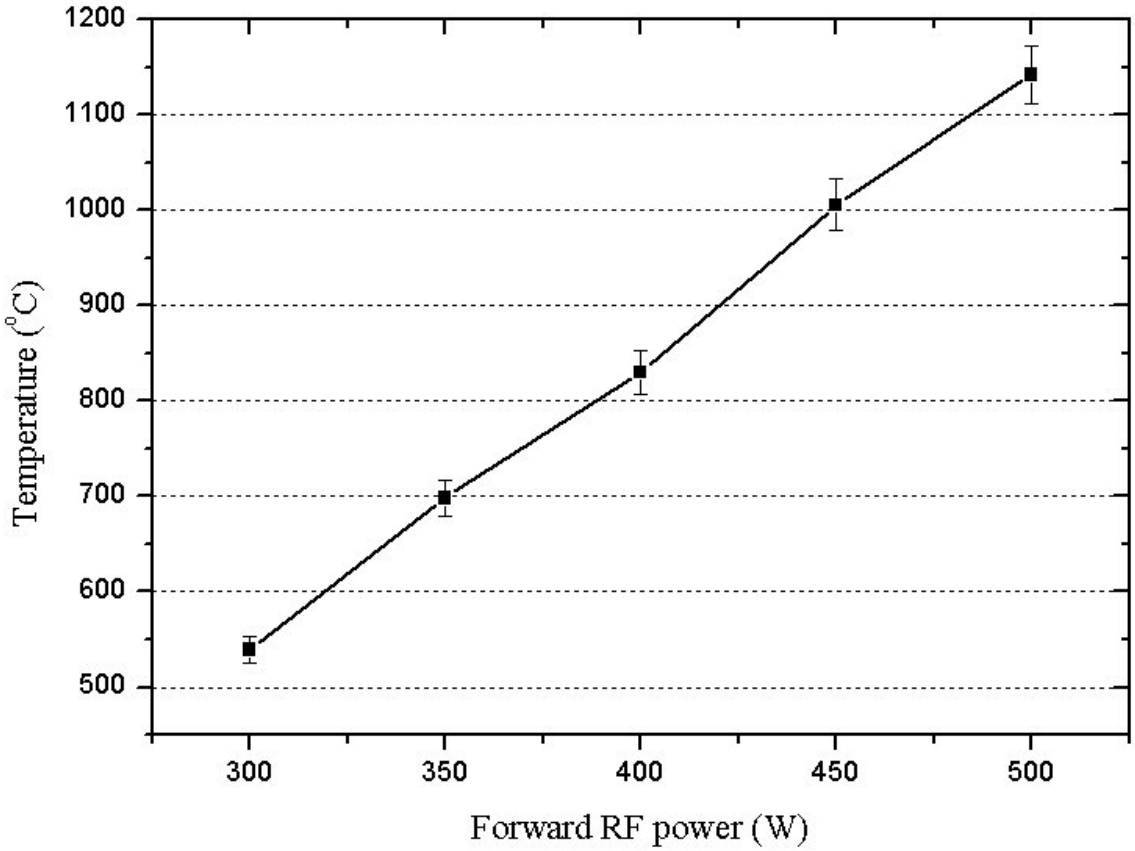


Torch performances





Torch temperature



- **Temperature at 10 cm up from the nozzle**
- **Using the B-type thermocouple**
- **With Argon gas flow rate of 4 *lpm***

Plasma initiation