

## **NUMERICAL STUDY OF THE EXTINGUISHING PHENOMENA IN THE PULSED MODULATED INDUCTION THERMAL PLASMA TORCH**

*LONG MIAO, MINGQING NIE, YURI M GRISHIN, RUOYU HAN, ZIHAO HE, ZHENGXI ZHU, NINGFEI WANG*

*School of Aerospace Engineering, Beijing Institute of Technology, Beijing, China*

In this work, a two-dimensional unsteady laminar model is developed to simulate the transient process of the pulse-modulated induction thermal plasma. A standard PL-50 type induction thermal plasma torch is considered in the model, and the generator frequency is 3MHz, the coil current is set in the range of 100-200A. The critical current is studied to determine the waveform to ensure that a smaller current can be used to sustain a stable discharge. Special attention is paid to investigate two different vortex pattern: Benard and toroidal vortex in induction thermal plasma torch under different inject tube diameter, central gas flow rate, shimmer current level and duty factor.