

Abstract Submitted  
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**Deposition of fluorinated diamond-like carbon films using pulsed plasma thruster<sup>1</sup>** TAKASHI KIMURA, MASAYASU IIDA, Nagoya Institute of Technology — Fluorinated diamond-like carbon films are deposited on the silicon substrate by the exposure of the pulsed plasmas where the feed gas is mainly generated from the ablation of insulator. An electrothermal pulsed plasma thruster with a discharge room in an insulator rod is used as the pulsed plasma for ablation of insulator (PPA), and the material of the insulator rod is polytetrafluoroethylene (PTFE). The PPA has an anode at the end of the room and a cathode of divergent nozzle at the exit of the room. Both the anode and the cathode are made of aluminum. The distance of 13 mm between the anode and the cathode is equal to the plasma length. The diameter of the insulator rod is 4 mm. The pulsed plasma is generated by the stored energy in the capacitor connected to the electrodes. The thickness of the fluorinated diamond-like carbon films deposited on the silicon substrate is about  $2\mu\text{m}$  -  $3\mu\text{m}$ , and the deposition rate, which depends on the stored energy, is about 0.12-0.20 nm/shot. The hardness of the film, which is measured by nanoindenter, decreases with the increase in the stored energy in the capacitor. The maximum of the hardness is about 5-7 GPa at the stored energy of 2.5-2.7 J.

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