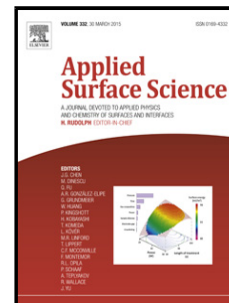


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Title: Microstructure and chemical bond evolution of diamond-like carbon films machined by femtosecond laser

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Highlights

DLC films were machined with diverse femtosecond laser power in air. From the microstructure analysis we could see that: (1) The machining depth was essentially proportional to the laser power; (2) The well patterned microgrooves and ripple structures with nanoparticles were formed distinctly in the channels. And the number of nanoparticles increased with the processing power as well; (3) It revealed a conversion from amorphous carbon to nanocrystalline graphite after laser treated with increasing laser power; (4) It showed that a great decrease of sp^3/sp^2 after laser treatment. The main processes responsible for the structure evolution were the generation of seed electrons for the following avalanche ionization.

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