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Deposition of Amorphous Diamond Films by Ion Beam Forward Sputtering**B. Kempf**

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The deposition of amorphous diamond layers on a substrate at room temperature requires carbon atoms impinging with energies in the range 20 - 200 eV. Conventional sputter configurations don't fulfil this requirement since the mean energy of sputtered particles amounts to some eV only. In the present work carbon atoms stemming from the forward sputtering lobe of a graphite target under Ar⁺ ion bombardment are used for film deposition. As a result of glancing collisions this lobe contains particles of much higher than average energy. The special target which is located between ion gun and substrate works like a blind. Its lamellas are inclined against the beam axis to shield primary ions from the substrate. Due to a high aspect ratio between lamella depth and spacing only atoms sputtered into a narrow aperture come through. Raman spectroscopy, electrical resistance and ellipsometry are used to characterise the films. Sputter parameters for amorphous diamond condensation are determined.