

Conductivity of ion tracks in diamond-like carbon films

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High-energy heavy ions (e.g. 1 GeV uranium ions) passing through a diamond-like carbon (DLC) film create conducting tracks along their path. The conductivity of these channels is due to a conversion of diamond sp^3 bonds to graphite sp^2 bonds caused by the large energy deposited along the ion track. The tracks have a diameter of approximately 10 nm and represent conducting filaments embedded in the insulating diamond-like matrix. They might be used as electron field emitters in vacuum electronic devices.