

SAIP2014



Contribution ID : 147

Ion dose effect on sound velocity in ion-implanted CVD diamond studied using surface Brillouin scattering

Wednesday 09 Jul 2014 at 15:00 (00h20')

Abstract :

Elastic, surface waves occurring in an ion-damaged region of diamond were studied using surface Brillouin scattering (SBS). By observing the Rayleigh-like mode of pure diamond, ion implanted diamonds to doses of 1×10^{16} ions/cm² and 1.5×10^{16} ions/cm² we noted that pristine diamond has the highest surface wave velocity of ≈ 12500 m/s, while the heavily implanted diamond has the lowest velocity of ≈ 12300 m/s. Elastodynamic Green's functions simulation played an important role in predicting and confirming the spectra observed experimentally. This work has shown that a necessary condition for observing Brillouin spectrum is optically smooth surfaces even in transparent media. It has also been observed that the optical flatness of the surface, front and back plays a vital role in surface Brillouin scattering measurements.

Award :

No

Level :

N/A

Supervisor :

BA Mathe, SR Naidoo, TE Derry, J D Comins DST CoE SM & MPRI, School of Physics, University of the Witwatersrand

Paper :

No

Primary authors : Mr. MOTOCHI, Isaac (University of the Witwatersrand)

Co-authors : Dr. MATHE, Bhekumusa (University of the Witwatersrand) ; Dr. NAIDOO, Mervin (University of Witwatersrand) ; Prof. DERRY, Trevor (University of the Witwatersrand) ; Prof. COMINS, Darrell (University of the Witwatersrand)

Presenter : Dr. MATHE, Bhekumusa (University of the Witwatersrand)

Session classification : DPCMM1

Track classification : Track A - Division for Physics of Condensed Matter and Materials

Type : Oral Presentation