

# SAIP2013



Contribution ID : 527

## **Back surface influence on Brillouin scattering in ion-implanted chemical vapor deposited diamond**

Wednesday 10 Jul 2013 at 13:50 (00h20')

### **Abstract :**

Brillouin scattering measurements on thin opaque films seems to work nicely as long as the scattering surface is optically smooth. In transparent materials the measurements become complex due to the combination of surface ripple mechanism and elasto optic scattering occurring within the sample bulk. Condition for observing a Brillouin spectra is an optically smooth surface. Even in transparent surfaces the surface where light interacts with the surface need to be optically smooth. For materials that transmit light like diamond, the reflection from the backside plays an important role in obtaining a meaningful spectrum. Brillouin scattering measurements have been made to find out how the nature of the back surface for both pristine and ion-implanted diamond affects the spectra. While the spectra for a diamond sample polished on both sides and fixed to an aluminium holder using a double sided tape had other features, the same sample lacked them when fixed without the tape. The case where the unpolished side was held to the back side, no spectrum for both pristine and heavily ion implanted samples was observed. This implies that the nature of the surface, front and back plays a vital role on what can be measured in Brillouin scattering. Using Green's elastodynamic functions, further analysis has been done to calculate sound velocity in the different samples.

### **Award :**

Yes

### **Level :**

PhD

### **Supervisor :**

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### **Paper :**

No

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**Session classification :** DCMPM2

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

**Type :** Oral Presentation