Contribution ID: **65** Type: **Oral Presentation**

A synthetic diamond probe for both low-energy mammography X-rays and high-energy electron therapy beams

Friday, 15 July 2011 11:00 (15 minutes)

<p>Although diamond has been studied for dosimetry principally due to its near tissue-equivalence, its use in both low-energy X-rays and high-energy electron beams has not been reported. This report is based on dosimetric studies of a synthetic diamond probe when subjected to diagnostic mammography X-ray photons and megavoltage electron therapy beams. The probe, constructed using entirely tissue-equivalent Perspex body was configured for radiation dose measurement in either 'edge-on' or 'flat-on' exposure geometry without having first, to re-orientate the diamond within the body of the detector, and it was designed to be compatible with commercial electrometer systems. The radiation response of the diamond tested showed negligible energy dependence; its minimal background signal, high sensitivity (547.52 nC Gy<sup>

-1</sup>mm⁻³) and suitability for measurements in small radiation fields of steep dose gradients due to its small size make it suitable for clinical dosimetry. The presented probe has the potential advantage of replacing conventional radiation dosimeters.

Level (Hons, MSc,
   PhD, other)?

PhD

Consider for a student
   award (Yes / No)?

Yes

Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

No

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Session Classification: Applied

Track Classification: Track F - Applied and Industrial Physics