AbstractID: 8855 Title: Evaluation of HDR brachytherapy dose distributions using PRESAGE three-dimensional polymer dosimeter and optical CT readout

Method and Materials: An Ir-192 line source was simulated using Plato treatment planning software to administer 6 Gy at the surface of a vaginal applicator. A series of reference points were generated to identify the dose drop-off axially, as well as in the anisotropy region. The treatment plan was then used to irradiate the PRESAGE™ polymer dosimeter. The dosimeter was subsequently evaluated using the Vista Optical CT Scanner (Modus Medical Devices Inc.) in conjunction with VistaRecon™ software (Bosi *et al* 2007). Comparisons were made between the three-dimensional optical measurements, the treatment plan and Monte Carlo simulations using the PENELOPE.

Results: Good comparative agreement was found. The dose agreement in the axial direction from the PRESAGE and TPS was within 4% up to 2cm from the surface of the applicator.

Conclusion: The PRESAGE™ dosimeter was shown to have potential as a three-dimensional dosimeter for use with IMRT, conformal and brachytherapy radiotherapy treatment verification.

Reference: Bosi SG, Naseri P, Puran A, Davies J, Baldock C, 2007. Initial investigation of a novel light-scattering gel phantom for evaluation of optical CT scanners for radiotherapy gel dosimetry. *Phys. Med. Biol*. **52** 2893–2903.