Monte Carlo simulation and dosimetric studies for small fields in lung stereotactic body radiation therapy

The use of small photon fields in radiotherapy has increased over the recent years. However, prediction and verification of small field doses continue to prove to be difficult. Accurate prediction of small field doses can be achieved using Monte Carlo (MC) simulations. The aim of this study is to use MC simulation to study the accuracy of commercial dose calculation algorithms used in treatment planning and to correct dose perturbation for radiation dosimeters for small lung SBRT fields. This is done using a three pronged approach, (1) by the determination of optimal small field parameters for MC simulation (2) by evaluating the accuracy of dose calculation algorithms for small lung SBRT field sizes in the clinical treatment planning system (TPS), (3) by accurate measurement of dose profiles using calibrated film and thermoluminescence small field dosimetry.

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Venue: Conference Room, SPMS Level 2
Supervisor: Assoc Prof Lew Wen Siang