

AbstractID: 10228 Title: Testing the  $Sc$ ,  $Sp$ ,  $Scp$  formalism for Elekta Beam Modulator

**Purpose:** The Elekta Beam Modulator™ (EBM) has a unique design in the sense that no movable jaws exist. The MLC has 40 leaf pairs with 4 mm wide leaves. A fixed diaphragm is beneath the MLC to form an aperture of 21 cm by 16 cm. The radiation fields are shaped primarily by the MLC. The goal of this work is to test whether the conventional  $Sc$ ,  $Sp$ ,  $Scp$  formalism holds true for this accelerator head configuration. **Method and Materials:** We have postulated two methods for determining  $Sc$  for the EBM: Method A: set  $Sc = 1$  for all fields because there are no movable jaws; and Method B: regard the MLC as the “jaws”, since the apertures are formed by the MLC. We measured  $Sc$  for Method B using Wellhofer CC13 and PTW 30010 ion chamber with build-up caps. Both setups were configured in RadCalc and calculations compared to measurements. **Results:** 6 MV results are reported. For 100 MU, dose was measured for standard square, rectangle, and off-axis irregular shaped fields. For the standard fields, both methods agree with measurements to within 0.5%, except for the smallest field  $2.4 \times 2.4 \text{ cm}^2$ . For the off-axis and irregular fields, both calculations differ from the measured dose by 3~7%. The two methods agree within 0.5% for most standard fields, and the difference between them tends to increase for the off-axis and irregular fields. **Conclusions:** Two methods to calculate Elekta Beam Modulator (EBM) point doses using the  $Sc$ ,  $Sp$ ,  $Scp$  formalism were tested. Both agree well with the measurement for the standard fields. However, they start to deviate from the measurements for off-axis and irregular fields. More testing, including 10MV and 15MV, is planned and will be presented for this unique machine.