S2 Text

Full width at half maximum (FWHM), flatness, symmetry and penumbra.
The analysis was performed following the guideline of the AAPM protocol
TG-45 [1]. All beam profiles were normalized to the dose maximum and the FWHM
was defined as the distance between the 50 % dose points. The flatness is defined along
80 % of the cross-section area and gives its maximum dose variation, according to

$$Flatness = \frac{Dmax - Dmin}{Dmax + Dmin} \tag{1}$$

The deviation of the "left-side" dose and the "right-side" dose at 80 % of the
FWHM points describes the symmetry of a field

$$Symmetry = max(|D(x) - D(-x)|) \tag{2}$$

The width of the penumbra is defined between 80 % and 20 % of the maximum
dose as the lateral distance on both sides of the beam profile.

FWHM, flatness, symmetry and penumbra were determined for angles of 0˚, 45˚,
90˚ and 135˚. Mean and standard deviations were calculated.

References

1. Nath R, Biggs PJ, Bova FJ, Ling CC, Purdy JA, van de Geijn J, Weinhous MS.
   AAPM code of practice for radiotherapy accelerators: Report of AAPM
   Radiation Therapy Task Group No. 45. Med Phys 1994;21:1093-1121.