Abstract Submitted
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Anomalous fluorescence line intensity in megavoltage bremsstrahlung[1] NINO PEREIRA, Ecopulse. Inc, MARC LITZ, GEORGE MERKEL, Army Research Laboratory, JOSEPH SCHUMER, JOHN SEELY, Naval Research Laboratory, JEFF CARROLL, Youngstown State University — A Cauchois transmission crystal spectrometer intended for laser plasma diagnostics has measured an anomalous ratio between the fluorescence lines in megavoltage bremsstrahlung. When observed in reflection, Kα_1 fluorescence is twice as strong as the Kβ line, as is usual. However, in forward-directed bremsstrahlung from a 2 MV end point linear accelerator with a tungsten converter, the Kα_1 and Kβ fluorescence are approximately equal. The anomalous fluorescence line ratio, unity, reflects the large amount of fluorescence generated on the side of the converter where the electrons enter, and the differential attenuation of the fluorescence photons as they pass through the converter to opposite side. Understanding of fluorescence in megavoltage bremsstrahlung is relevant to the explanation of anomalous line ratios in spectra produced by high-energy electrons generated by intense femtosecond laser irradiation.

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