

Abstract Submitted
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Study of the angular distributions of X-rays emitted following L_3 ionization of gold atoms by electron impact I. WRIGHT, G. SESTRIC, S. FERGUSON, S. WILLIAMS, Angelo State University — Theoretical work suggests that when an atomic inner-shell vacancy with total angular momentum j greater than $1/2$ is created by interaction with a photon or charged particle the vacancy will be aligned due to the magnetic sublevels of the ion having nonstatistical populations. The experiments we performed, testing this theory, involved measurements of the angular distributions of gold L_α , L_β , and L_l X-rays at forward angles in the range 0 degrees to 25 degrees emitted after being bombarded with 15-keV electrons. After corrections for absorption of the characteristic X-rays within the gold target, our results suggest that the angular distributions of the L_α and L_β X-rays are essentially isotropic, as no angular dependence was observed in our data outside of experimental uncertainties. However, the results of our experiments suggest that the angular distribution of the gold L_l X-rays may be weakly anisotropic.

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