Abstract Submitted
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Energy of atomic shakeoff electrons from positron decay of 37K[1] JOHN BEHR, TRIUMF, BENJAMIN FENKER, Texas A&M University, ALEXANDRE GORELOV, TRIUMF, MELISSA ANHOLM, U. Manitoba, SPENCER BEHLING, MICHAEL MEHLMAN, DAN MELCONIAN, Texas A&M University, DANNY ASHERY, Tel Aviv U., GERALD GWINNER, U. Manitoba — We have measured the low-energy atomic shakeoff electron spectrum from the β^+ decay of ^{37}K. We collect atomic electrons emitted from laser-cooled ^{37}K using a nearly uniform electric field at low magnetic field into a position-sensitive microchannel plate. A coincidence with energetic β^+s removes background. The differential position information translates to a differential electron energy spectrum. The energy spectrum from 1-100 eV is reproduced well by an analytic calculation for hydrogenic wavefunctions [Levinger PR 90 11 (1953)] using potassium quantum defects. Less than one percent of the electrons have energies higher than the 25 eV threshold for double DNA strand breaks, so relative biological effectiveness would not be altered by including these electrons. The average energy carried off by these electrons (a few eV) is smaller than expected from simple Thomas-Fermi estimates (65eV) [Serber and Snyder PR 87 152 (1952)]

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