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Simulation of the positron and electron trajectories for a new Time of flight (TOF) Spectrometer for positron annihilation induced Auger electron spectroscopy (PAES) with high flux positron beam[1] R. GLADEN, Z.H. LIM, VARGHESE ANTO CHIRAYATH, P.V. JOGLEKAR, K. SHASTRY, A.R. KOYMEN, A.H. WEISS, Univ of Texas, Arlington — A new high flux positron beam line is under construction for TOF-PAES as well as for spin polarized coincidence Doppler broadening spectroscopy for surface characterization in the University of Texas at Arlington (UTA). This beam line has a high efficiency rare gas moderator system and employs a combination of axial and transverse magnetic fields for the selection of positron beam energy. The moderator system feeds the mono-energetic positron beam into the TOF-PAES system where transverse electromagnetic fields (trochoidal analyzer) allow the simultaneous passage of the positron beam and the electrons emitted from the sample. Here we describe the characteristics of the positron beam trajectories from the source to the target through this beam line using SIMION. These simulations have been used to optimize the axial and transverse magnetic field values at the energy selector as well the electrostatic potentials at the trochoidal energy analyzer. The trajectories of the secondary electrons ejected from the sample as a result of the positron beam interaction are also described for various ejection angles and energies. These later simulations have been utilized to optimize the height of the channel plate used for the detection of electrons.

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