

Experimental energy resolution of a paracentric hemispherical deflector analyzer for different entry positions and bias simulated in SIMION

G.G.Gennarakis^a, T.J.M.Zouros^{a,b}

^a*Department of Physics, University of Crete, P.O Box 2208 GR-71003 Heraklion, Greece*

^b*Tandem Lab, INPP, NCSR Demokritos, P.O Box 60228, GR-15310, Ag.Paraskevi, Greece*

Abstract

Results from the simulation of a biased paracentric hemispherical deflector analyzer (HDA) with injection lens are presented. The finite differences electron optics software SIMION was used to perform Monte Carlo type trajectory simulations in an effort to investigate the focusing effects of the HDA entry and exit fringing fields which are used to improve energy resolution - a novel feature of this type of analyzer. Comparisons to recent experimental results are also presented. Biased paracentric HDAs represent a novel class of HDAs, which use the lensing action of the strong fringing fields at the HDA entry, to restore the first order focus characteristics of ideal HDAs in a controlled way. The improvement in energy resolution and transmission without the use of any additional fringing field correction electrodes is of particular interest to modern analyzers using position sensitive detectors.

Keywords: Hemispherical Analyser, SIMION, Electron Spectroscopy, Electromagnetic lens
