Resonance structure of the photoelectron $\beta_{nl}$ parameter versus autoionizing resonance minima in partial $\sigma_{nl\pm1}$ cross sections: A model of “complete” experiments with fewer measurements\textsuperscript{1} VALERIY DOLMATOV, EMRE GULER, University of North Alabama — The relationship between the structure of the autoionizing resonance minima in partial photoionization cross sections $\sigma_{nl\pm1}$ and the resonance profile of the dipole photoelectron angular distribution parameter $\beta_{nl}$ in the vicinity of the resonance is established. From this, the information can be extracted (from known $\beta_{nl}$ alone) on the energy positions and ordering of autoionizing resonance minima in $\sigma_{l\pm1}$, the energies at which $\sigma_{l+1}$ and $\sigma_{l-1}$ are equal, signs and magnitudes of relative phase shifts of the photoionization amplitudes $D_{l\pm1}$ through the autoionizing resonance energy region, and the magnitudes of $D_{l\pm1}$ at extreme points in $\beta_{nl}$; no tedious experimentation with electron spin polarization or light polarization is required. The established relationship expands our previously developed, so to speak “point” model of “complete” photoionization experiments with fewer measurements [V.K. Dolmatov and S.T. Manson, PRA 58, R2635 (1998)] onto a broader energy region [V.K. Dolmatov, E. Guler, S.T. Manson, PRA (submitted)].

\textsuperscript{1}This work was supported by NSF grant PHY-0652704.

Valeriy Dolmatov
University of North Alabama

Date submitted: 16 Aug 2007

Electronic form version 1.4