

Abstract Submitted
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DIQUIS observation of $n=2\rightarrow 7$ He $2pnp$ 1D autoionizing resonances.¹ N.L.S. MARTIN, B.A. DEHARAK, U. Kentucky, S.H. SOUTHWORTH, E.P. KANTER, B. KRAESSIG, L. YOUNG, Argonne National Laboratory, R. WEHLITZ, U. Wisconsin — We have applied the technique of DIpole-QUadropole Interference Spectroscopy (DIQUIS) to make the first observation of an optically forbidden Rydberg series using photoelectron spectroscopy. The He $2pnp$ 1D autoionizing levels appear as a series of resonances in the non-dipole γ parameter.² The experiments were carried out at the Synchrotron Radiation Center, University of Wisconsin-Madison using an electron spectrometer system, designed and built at Argonne National Laboratory, to efficiently measure nondipole asymmetries in photoelectron angular distributions. We will present measurements of γ for photon energies that cover the $n = 2 \rightarrow 7$ resonance region. Fits to the data yield values of level positions, widths, and Fano q parameters.

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²B. Krässig, E.P. Kanter, S.H. Southworth, R. Guillemin, O. Hemmers, D.W. Lindle, R. Wehlitz, and N.L.S. Martin, Phys. Rev. Lett. **88**, 203002 (2002).

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