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Double-Excited States of Mg below the $Mg^+(3p)$ Threshold¹ DRAGAN LUKIĆ², Institute of Physics, Belgrade, Serbia, PAVLE JURANIĆ, Synchrotron Radiation Center, Univ. of Wisconsin-Madison, RALF WEHLITZ, Synchrotron Radiation Center, Univ. of Wisconsin-Madison — The photoionization process from the valence shell of alkaline earth atoms just above the first ionization threshold shows clear deviation from the simple one-electron picture. This is due to electron correlations between the two outer electrons, which can be simultaneously excited into states above the first ionization limit. It is well known that in the energy region between the first and second ionization threshold the spectra are dominated by two double-excitation series, one broad $(npms \ ^1P_1, \ m > n)$ and one narrow $(npmd \ ^1P_1, m \ge n)$ series. For Mg it was predicted ³ that a weaker autoionization series $(npms {}^{3}P_{1}, m > n)$ will be superimposed on the broad resonance series due to the onset of relativistic effects and, thus, the breakdown of the LS coupling scheme for Mg. Using highly monochromatized synchrotron radiation, we have found clear evidence for this weak series and will present improved resonance parameters for the autoionizing resonances.

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³V. Radojević and W. R. Johnson, Phys. Rev. A **31**, 2991 (1985).

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