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Unusual excitation spectra of magnesium-related donor impurities in silicon L.T. HO, Institute of Physics, Academia Sinica, Taipei, Taiwan — It is well known that the group-II magnesium, when diffused into silicon, enters the silicon lattice interstitially and behaves as a helium-like double donor. Magnesium has also been found to be able to pair with dispersed oxygen in silicon to form magnesium-oxygen complex impurity, which is an interstitial double donor as well. Previous studies on the excitation spectra of these helium-like impurities indicate that the excited states of neutral magnesium donor or neutral magnesium-oxygen complex donor are all similar to those of hydrogen-like group-V donor impurities in silicon. Recently, however, from further study of the excited spectra of these magnesium-related donor impurities, we have observed some very unusual result totally unexpected and clearly different from a typical donor spectrum in silicon.

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