Spin-mixed doubly excited resonances in Ca and Sr spectra TU-NAN CHANG, USC, T.K. FANG, Fu-Jen Catholic U., Taiwan — For heavier alkaline-earth atoms, with a smaller energy separation between higher excited autoionizing resonances and a more substantial spin-dependent interaction, one expects a stronger mixing between different spin states and thus more complicated spectra. However, the earlier observed spectra have shown that the resonance structures are, in fact, relatively smooth above the second ionization threshold compared with those between the first and second ionization threshold, where the resonance decays only into one dominating ionization channel. The lack of complex resonance structure results primarily from a much faster decay rate in the presence of multiple decay channels with a broader total resonance width and substantial overlaps between neighboring resonances. In this work, we present a detailed theoretical estimate the spin mixing, based on the BSCR approach [1], to demonstrate explicitly how the spin-dependent interaction affects the mixing of different spin states along various autoionization series for Ca and Sr as energy increases. [1] T. K. Fang and T. N. Chang, Phys. Rev. A76 012721 (2007).