Effects of electron correlation on the time-delay in photoionization of atomic beryllium LARS BOJER MADSEN, JUAN OMISTE, WENLIANG LI, Department of Physics and Astronomy, Aarhus University — We report on the effects of electron correlation on the relative time-delay in photoionization of atomic beryllium in the channels $\text{Be}[(1s^22s^2)\,^1S^e] \rightarrow \text{Be}^+[(1s^22s)\,^2S^o] + e^- (p\,\text{electron})$, and $\text{Be}[(1s^22s^2)\,^1S^e] \rightarrow \text{Be}^+[(1s^22p)\,^2P^o] + e^- (s\,\text{or}\,d\,\text{electron})$. We use our recent three-dimensional implementation of the time-dependent restricted-active-space self-consistent-field method and study the changes in the value obtained for the time-delay when including more and more correlation. We find that the mean-field, time-dependent Hartree-Fock theory does not account accurately for the time-delay. A larger active orbital space is needed. We find that the relative time-delay between ionization into $\text{Be}^+[(1s^22s)\,^2S^o]$ and $\text{Be}^+[(1s^22p)\,^2P^o]$ is around 7-8 attoseconds.

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