Study of $\eta_c$ decays with the STARLIGHT Monte-Carlo at LHC Run 2 energies\(^1\) JORDAN ROTH, Creighton University — An introduction to ultra-peripheral collisions and the STARLIGHT Monte-Carlo event generator is provided. STARLIGHT is used, in conjunction with PYTHIA 8, to compute the invariant mass spectrum of the $\eta_c$ via its decay channels $\eta_c \rightarrow K_S^0 K^+ \pi^- \rightarrow \pi^+ \pi^- K^+ \pi^-$ and $\eta_c \rightarrow K^{*}(892)^0 K^+ \pi^- \rightarrow K^+ \pi^- K^- \pi^+$. Charge conjugate- and background processes are also studied. Simulations are made for photon-photon production in a pseudorapidity range between $-1$ and $1$ at center-of-mass collision energies of $\sqrt{s_{NN}} = 5.12$ TeV in Pb-Pb collisions. The potential for observing these decays in recent LHC heavy-ion data will be discussed.

\(^1\)This work was supported in part by the United States Department of Energy Office of Science.