Comet 209P/LINEAR and the associated Camelopardalids meteor shower

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Previous studies have suggested that comet 209P/LINEAR may produce strong meteor activity on the Earth on 2014 May 24. Here we present our observations and simulations prior to the event. We reanalyze the optical observations of P/LINEAR obtained during its 2009 apparition to model the corresponding meteor stream. We find that the comet is relatively depleted in dust production, with $Af\rho$ at 1-cm level within eight months around its perihelion. A syndyne simulation shows that the optical cometary tail is dominated by larger particles with $\beta \sim 0.003$. Numerical simulation of the cometary dust trails confirms the arrival of particles on 2014 May 24 from some of the 1798–1979 trails, with nominal radiant in the constellation of Camelopardalis. Given that the comet is found to be depleted in dust production, we concluded that a meteor storm may be unlikely. However, our simulation also shows that the size distribution of the arrived particles is skewed strongly towards larger particles, which, coupling with the result of the syndyne simulation, suggested that the event (if detectable) may be dominated by bright meteors. Preliminary results from the observations of P/LINEAR during its 2014 apparition as well as the Camelopardalids meteor shower will also be presented.