# Ensemble Properties of Comets in the Sloan Digital Sky Survey

Michael Solontoi, Zeljko Ivezic, Mario Juric, Andrew C. Becker, Lynne Jones, Andrew A. West, Steve Kent, Robert H. Lupton, Mark Claire, Gillian R. Knapp, Tom Quinn, James E. Gunn, Donald P. Schneider

*(Submitted on 17 Feb 2012)*

We present the ensemble properties of 31 comets (27 resolved and 4 unresolved) observed by the Sloan Digital Sky Survey (SDSS). This sample of comets represents about 1 comet per 10 million SDSS photometric objects. Five-band (u,g,r,i,z) photometry is used to determine the comets' colors, sizes, surface brightness profiles, and rates of dust production in terms of the Af{\rho} formalism. We find that the cumulative luminosity function for the Jupiter Family Comets in our sample is well fit by a power law of the form N(< H) \propto 10(0.49\pm0.05)H for H < 18, with evidence of a much shallower fit N(< H) \propto 10(0.19\pm0.03)H for the faint (14.5 < H < 18) comets. The resolved comets show an extremely narrow distribution of colors (0.57 \pm 0.05 in g - r for example), which are statistically indistinguishable from that of the Jupiter Trojans. Further, there is no evidence of correlation between color and physical, dynamical, or observational parameters for the observed comets.

| | |
|---|---|
| Comments: | 19 pages, 8 tables, 11 figures, to appear in Icarus |
| Subjects: | **Earth and Planetary Astrophysics (astro-ph.EP)** |
| DOI: | 10.1016/j.icarus.2011.10.008 |
| Cite as: | **arXiv:1202.3999 [astro-ph.EP]** |
| | (or **arXiv:1202.3999v1 [astro-ph.EP]** for this version) |

## Submission history

From: Michael Solontoi [view email]
**[v1]** Fri, 17 Feb 2012 20:00:08 GMT (516kb)

*Which authors of this paper are endorsers?*