

Data mining of sky surveys for automatic identification of Solar System Objects

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Nowadays, the huge amount of astronomical observational data available to the community imposes the need for fast and reliable tools so as to process all this information. In particular, the data mining of past sky surveys can provide us a huge amount of non-exploited astrometrical positions and multi-wavelength magnitudes (from visible to near infrared) of the solar system objects. Moreover this information can go back prior to the discovery of the objects so that they are more interesting. Our goal is to develop a Virtual Observatory (VO) data mining tool that is able to perform an automatic identification of the Solar System Objects (SSO) present in today's vast astronomical archives. The guideline of this work, founded on the use of our VO tool "SkyBoT", is to get new astrometric observations of SSO in order to improve our knowledge of their orbits and, especially for Near Earth Objects (NEO), to compute more accurately their ephemeris in the future. As a first application, we have analysed the near-infrared sky survey DENIS. As of April 2007, we have obtained preliminary results which are promising. Among the 5206 strips of the survey (each strip being composed of 180 images) we have found approximately 20,800 correlated observations of $\sim 15,600$ SSO of which 313 observations concern 230 NEOs. We have also found 7720 unclassified celestial objects of which a part is certainly unknown SSO at that day.