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Title: Old photographic plates in the Gaia era: archive plates of Pulkovo observatory, its digitization, results of astrometric reduction, error analysis.

Abstract: The tasks of astronomy, for which digitization of the old photographic plates and their new reduction can be useful are discussed. Information on the photographic plates of "glass archive" of Pulkovo Observatory (50200 plates) and a description of the database of photographic plates ([www.puldb.ru /db/plates](http://www.puldb.ru/db/plates)) is given. The results of astrometric reductions for 1800 plates with asteroids, digitized by a flatbed scanner, and the results for the 223 plates with asteroids and Pluto, digitized by the Damian digitizer in the ROB, are shown. The error of the measured coordinates (X,Y) is 0.9-1 μm for a flatbed scanner and 0.2-0.3 μm for the Damian digitizer. The accuracy of astrometric reduction (the error of unit weight) for a flatbed scanner is within 110-130 mas, for the Damian digitizer - 85-105 mas. UCAC3 catalog was used as a reference. Errors associated with measuring device, with the quality of photographic plates and astrometric reduction are analyzed.