

Meridian Circle Observations of the Planets and their Satellites

E.M.Standish (JPL/CalTech)

Throughout the nineteenth and much of the twentieth centuries, planetary ephemerides were based entirely upon meridian circle observations from a number of different observatories. For much of that time, these observations represented possibly the most accurate measurements of anything in the history of mankind. Even at present, meridian circle observations form an important part of the data fit by the JPL ephemerides: especially the photoelectric observations which have shown a further improvement in accuracy over the past decade. For the present study, however, some of the earlier meridian circle observations have been analysed, with the intention of incorporating their information also into the data set. Various sets of the earlier observations, however, show varying degrees of usefulness because of some surprising reasons. Observations by Lalande in 1795 are of special interest for ephemerides, because they contain two (unintentional) observations of the planet Neptune. Observations by Robertson in the early 1800's are also of interest for ephemerides, because they include measurements of Uranus; however, there are some suspicious features of Robertson's early measurements which render their validity questionable.