



## **Estimating the Q of the Chandler Wobble from Its Free Decay**

Richard Gross

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, United States (Richard.Gross@jpl.nasa.gov)

The Earth wobbles as it rotates because it is not rotating about its figure axis. In addition to the forced wobbles of the Earth that are caused by changes in the motion and distribution of the mass of its various components like its atmosphere and oceans, the Earth also naturally wobbles. In the absence of excitation, and because of dissipation processes within the Earth, the amplitude of this natural, or Chandler, wobble would exponentially decay with a time constant proportional to its Q, the quality factor of the wobble. Examining observations of the Chandler wobble since 1900 reveals that it apparently freely decayed during the early 1960s. The Q associated with this apparent free decay is 32.5, somewhat lower than estimates of the Chandler wobble's Q that have been obtained recently by modeling its excitation by surface geophysical fluids. This may indicate that the Chandler wobble was, in fact, not in free decay during the early 1960s or, alternatively, that recent estimates of its Q based on modeling its excitation are biased high.