et al. (1991), for precession.

$$
\begin{aligned}
F_1 \equiv l &= \textit{Mean Anomaly of the Moon} \\
&= 134.96340251^\circ + 1717915923.2178'' t + 31.8792'' t^2 \\
&\quad +0.051635'' t^3 - 0.00024470'' t^4, \\
F_2 \equiv l' &= \textit{Mean Anomaly of the Sun} \\
&= 357.52910918^\circ + 129596581.0481'' t - 0.5532'' t^2 \\
&\quad +0.000136'' t^3 - 0.00001149'' t^4, \\
F_3 \equiv F &= L - \Omega \\
&= 93.27209062^\circ + 1739527262.8478'' t - 12.7512'' t^2 \\
&\quad -0.001037'' t^3 + 0.00000417'' t^4, \\
F_4 \equiv D &= \textit{Mean Elongation of the Moon from the Sun} \\
&= 297.85019547^\circ + 1602961601.2090'' t - 6.3706'' t^2 \\
&\quad +0.006593'' t^3 - 0.00003169'' t^4, \\
F_5 \equiv \Omega &= \textit{Mean Longitude of the Ascending Node of the Moon} \\
&= 125.04455501^\circ - 6962890.5431'' t + 7.4722'' t^2 \\
&\quad +0.007702'' t^3 - 0.00005939'' t^4
\end{aligned}
\tag{5.43}
$$

where L is the Mean Longitude of the Moon.

Note that the SOFA implementation of the IAU 2000A nutation takes the MHB2000 code (T. Herring 2002) as its definition of the IAU 2000A model. As part of this strict compliance, SOFA uses the original MHB2000 expressions for the Delaunay variables l' and D, that differ from Eq. (5.43) in that the fixed term is rounded to five digits (*i.e.* $1287104.79305''$ instead of $1287104.793048''$ for the Eq. (5.43) value in the l expression converted into arcseconds and $1072260.70369''$ instead of $1072260.703692''$ for the Eq. (5.43) value in the l expression converted into arcseconds), respectively. The CIP location is insensitive to this difference of 2 μas in the nutation arguments at a level better than 10^{-9} arcsec accuracy.

It should also be noted that the SOFA equinox based implementation of the IAU 2000A nutation follows the MHB2000 Fortran code in neglecting time variations of the out of phase components, *i.e.* the A_i''' and B_i''' columns of Table 5.3a (see Section 5.6.1). The difference in the CIP location is just over 2 μas after one century.

5.7.3 Development of the arguments for the planetary nutation

The mean longitudes of the planets used in the arguments for the planetary nutations are essentially those provided by Souchay *et al.* (1999), based on theories and constants of VSOP82 (Bretagnon, 1982) and ELP 2000 (Chapront-Touzé and Chapront, 1983) and developments of Simon *et al.* (1994: Tables 5.8.1-5.8.8). Their developments are given in Eq. (5.44) in radians with t in Julian centuries.