Table 4. Defining constants.

c	299792.458 km/s	Speed of light
au	149597870.700 km	Astronomical unit
β	1.0	PPN parameter
γ	1.0	PPN parameter

Table 5. Initial positions (au) and velocities (au/day) of the Sun and planets at Julian day (TDB) 2440400.5 (June 28, 1969), given with respect to the integration origin in the ICRF2 frame.

Sun	x, y, z	0.00450250878464055477	0.00076707642709100705	0.00026605791776697764
	v_x, v_y, v_z	–0.00000035174953607552	0.00000517762640983341	0.00000222910217891203
Mercury	x, y, z	0.36176271656028195477	–0.09078197215676599295	–0.08571497256275117236
	v_x, v_y, v_z	0.00336749397200575848	0.02489452055768343341	0.01294630040970409203
Venus	x, y, z	0.61275194083507215477	–0.34836536903362219295	–0.19527828667594382236
	v_x, v_y, v_z	0.01095206842352823448	0.01561768426786768341	0.00633110570297786403
EM Bary	x, y, z	0.12051741410138465477	–0.92583847476914859295	–0.40154022645315222236
	v_x, v_y, v_z	0.01681126830978379448	0.00174830923073434441	0.00075820289738312913
Mars	x, y, z	–0.11018607714879824523	–1.32759945030298299295	–0.60588914048429142236
	v_x, v_y, v_z	0.01448165305704756448	0.00024246307683646861	–0.00028152072792433877
Jupiter	x, y, z	–5.37970676855393644523	–0.83048132656339789295	–0.22482887442656542236
	v_x, v_y, v_z	0.00109201259423733748	–0.00651811661280738459	–0.00282078276229867897
Saturn	x, y, z	7.89439068290953155477	4.59647805517127300705	1.55869584283189997764
	v_x, v_y, v_z	–0.00321755651650091552	0.00433581034174662541	0.00192864631686015503
Uranus	x, y, z	–18.26540225387235944523	–1.16195541867586999295	–0.25010605772133802236
	v_x, v_y, v_z	0.00022119039101561468	–0.00376247500810884459	–0.00165101502742994997
Neptune	x, y, z	–16.05503578023336944523	–23.94219155985470899295	–9.40015796880239402236
	v_x, v_y, v_z	0.00264276984798005548	–0.00149831255054097759	–0.00067904196080291327
Pluto	x, y, z	–30.48331376718383944523	–0.87240555684104999295	8.91157617249954997764
	v_x, v_y, v_z	0.00032220737349778078	–0.00314357639364532859	–0.00107794975959731297

Table 6. Initial position (au) and velocity (au/day) of the Moon at Julian day (TDB) 2440400.5 (June 28, 1969), given with respect to Earth in the ICRF2 frame.

Moon	x, y, z	–0.00080817735147818490	–0.00199462998549701300	–0.00108726268307068900
	v_x, v_y, v_z	0.00060108481561422370	–0.00016744546915764980	–0.00008556214140094871

Table 7. Lunar mantle and core initial Euler angles (radian) and angular velocities (radian/day) at Julian day (TDB) 2440400.5 (June 28, 1969). Note that the core angular velocity is expressed in the mantle frame.

ϕ_m, θ_m, ψ_m	0.00512830031411853500	0.38239278420173690000	1.29416700274878300000
$\omega_{m,x}, \omega_{m,y}, \omega_{m,z}$	0.00004573724185991433	–0.00000218986174567295	0.22994486018992250000
ϕ_c, θ_c, ψ_c	–0.00241990927040684100	0.41101946488652730000	–0.46309468558363680000
$\omega_{c,x}, \omega_{c,y}, \omega_{c,z}$	–0.00661836772247824400	–0.00107295445159005100	0.22964879652299730000

Table 8. Mass parameters of major bodies.

Body	GM, au^3/day^2	$GM_\odot / GM_{body}$	GM, km^3/s^2
Sun	0.29591220828559110 0E–03	1.000000	132712440041.939400
Mercury	0.49124804503647600 0E–10	6023682.155592	22031.780000
Venus	0.72434523326441200 0E–09	408523.718658	324858.592000
Earth	0.88876924451256340 0E–09	332946.048834	398600.435436
Mars	0.95495486955507700 0E–10	3098703.590291	42828.375214
Jupiter	0.28253458408338700 0E–06	1047.348625	126712764.800000
Saturn	0.84597060732450300 0E–07	3497.901768	37940585.200000
Uranus	0.12920248257829600 0E–07	22902.981613	5794548.600000
Neptune	0.15243573478851100 0E–07	19412.259776	6836527.100580
Pluto	0.21784410519741800 0E–11	135836683.768617	977.000000
Moon	0.10931894507423740 0E–10	27068703.241203	4902.800066