JET PROPULSION LABORATORY **INTEROFFICE MEMORANDUM**

IOM 392R-21-010

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TO: Distribution

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SUBJECT: Updated delivery of JPL orbit solution 104 of Dimorphos: Revised system mass ratio

This IOM documents the delivery of the SPK file `dimorphos_s104.v2.bsp`, which contains the trajectories of Dimorphos and Didymos, and is an update to `dimorphos_s104.bsp`.

1 Update

The trajectory of Dimorphos relative to Didymos remains unchanged from the previous delivery and corresponds to solution 104 documented in IOM 392R-21-008, which should be referred to for details. As requested by the DART mission, we updated the Dimorphos-Didymos mass ratio to be 0.00929496451, which reflects the current project estimate of the Dimorphos equal-volume-sphere diameter (164 m) corresponding to the value in the latest DART Design Reference Asteroid release (v3.1).

Delivery

Files. The following files and documentation for Dimorphos are available from the JPL Solar System Dynamics (SSD) FTP server

`ftp://ssd.jpl.nasa.gov`

in the directory `pub/eph/small_bodies/dart/`, which will be the base directory for DART file deliveries from SSD. Within the `dart` directory are three sub-directories as follows:

`dart/dimorphos/` This directory holds the current ephemeris and related files for Dimorphos:

`dimorphos_s104.v2.bsp` - SPK file containing the ephemeris of Dimorphos (120065803) relative to the primary (920065803) and of 920065803 relative to the Didymos system barycenter (20065803). The latter was computed by assuming a secondary to primary mass ratio of 0.00929496451.

The time span of the SPK file is from 2000-Jan-01 to 2030-Dec-31. The associated covariance is listed in IOM 392R-21-008. We suggest scaling the formal uncertainties derived from this covariance by a factor of 1.3 in order to capture contributions from unmodeled parameters.

Acknowledgement

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References

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