Barycentric Julian Date

This online applet will convert a list of UTCs to a list of Barycentric Julian Dates in Barycentric Dynamical Time (BJD_TDB) to an accuracy of 20 ms, or the accuracy of double precision (~few ms) if the observatory is given. A brief, non-technical explanation of BJD_TDB can be found here. Mouse over or click the input headings for additional information.

There is a programmatic interface to this applet. Here is an example that converts a list of JD_UTCs to BJD_TDB for alpha Centauri. The RA and Dec are always in decimal hours and the FUNCTION can be utc2bjd, bjd2utc or hjd2bjd. It does not support any observatories, so is only accurate to 20 ms.

UTCs

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2020 01 08 23 29 00
2020 01 09 01 15 00
2020 01 09 03 00 00
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RA (J2000) 05 13 10.9 (HH MM SS.S / DDD.DDD)

DEC (J2000) +33 19 05.4 DD MM SS.S

-- Optional (default is geocenter) --

Earth-based observatory: Earth-based Observatory

-- or --

Latitude (degrees) 39.0021 | Longitude (degrees E) 283.0440 | Elevation (meters) 55.778

-- or --

Space Observatory: Space Observatory | Verbose

Submit -- User inputs are NOT logged

WARNING: BJD_TDB differs from the BJD in Coordinated Universal Time (BJD_UTC) by a systematic 32.184 + N seconds, where N is the number of leap seconds that have elapsed since 1961 (N = 34 as of Jan 1st, 2009). Always specify your time standard and **NEVER COMPARE BJD_TDB AND BJD_UTC DIRECTLY**.

This calculator **should not be used for targets inside the Solar System**. We (and all other online calculators we know of) use a plane wave approximation that is only accurate to 1000 seconds for the Moon, 100 seconds for the Main Asteroid Belt and 5 seconds for the Kuiper Belt. Our source code can, however, deal with this and can be run with a demo license of IDL (not tested on Windows). If you would benefit from an online tool that would work within the Solar System, please email me.

If you have made use of this calculator (or the source code) in a scientific paper, please cite our paper, which contains a more thorough explanation of the various corrections involved in this calculation.

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