

## Самостоятелна работа

- 6. Motion of a planet.** Most of the time, planets move from west to east relative to the background stars. Occasionally, however, they change direction and temporarily undergo retrograde motion. After a few weeks, the direction is changed again. The apparent motion of a planet was observed in Hangzhou this year. Table 1 lists the values of the 24 hour angular displacement of the planet relative to the background stars (simplified as ADRS) on the day that the observation was made. Modified Julian Day ( $MJD = JD - 2400000.5$ ) are used for the dates. Minus means the direction is from east to west.
- 6.1.** Find the date (MJD) when the planet is at stationary point (simplified as STP) and at opposition (simplified as OPP) graphically, respectively. Accurate to one day. Write your answer in table 2.
- 6.2.** What's the value of 24 hour angular displacement of the planet per day when it is at opposition? Write your answer in table 2.
- 6.3.** On the basis of the result of question 2, estimate the radius of the planet's orbit in astronomical units. Suppose the orbits of Earth and the planet are both circular and the planet is in ecliptic plane.

Table 1

Modified Julian Day	ADRS (degrees/day)
54944	0.15
54965	0.1
54975	0.07
54989	0.03
55001	-0.01
55014	-0.05
55020	-0.07
55032	-0.1
55043	-0.12
55055	-0.13
55062	-0.13
55074	-0.12
55084	-0.1
55092	-0.08
55099	-0.06
55109	-0.03
55121	0.01
55133	0.05

Table 2

MJD of STP	MJD of OPP	ADRS on the day of OPP