

result also contradicts those results obtained in [325].) For slower stars, this time interval covers all values  $t = 0, 1, \dots, 25$ .

In fact, the exactness of the method used by Efremov and Pavlovskaya [325] is less than that described above. Moreover, our calculation shows that by changing stars in the configuration considered in [325] we can vary the desired date from  $t^* = 13$  to  $t^* = 21$ . Since it was supposed in [325] that  $t^* = 16.5$ , the results obtained there cannot be considered correct.

Our numerical investigation confirmed the lack of exactness of other similar "point-minimum" methods. It appears that by slight variation of the initial data (for example, by changing the set of moving stars), we can vary the "point of minimum" from  $t = 0$  to  $t = 25$ . Moreover, it was discovered that the final result depends on the sort of distance used. This means that such results are extremely subjective.

The information kernel of the Almagest consists of twelve stars, designated "vocatur" (i.e., named). The twelve stars (with their modern astronomical names and Baily's numbers in brackets) are: Arcturus ( $\alpha$  Boo, 110), Sirius ( $\alpha$  CMa, 818), Aquila ( $\alpha$  Aql, 288), Previandematrix ( $\varepsilon$  Vir, 509), Antares ( $\alpha$  Sco, 553), Aselli ( $\gamma$  Cnc, 452), Procyon ( $\alpha$  CMi, 848), Regulus ( $\alpha$  Leo, 469), Spica ( $\alpha$  Vir, 510), Lyra ( $\alpha$  Lyr, 149), Capella ( $\alpha$  Aur, 222), Canopus ( $\alpha$  Car, 892).

Table 1 shows the deviation in latitudes  $|B_i(t) - b_i|$  for all these stars (in minutes) for several values of  $t$ .

**Table 1**  
Deviations in latitudes for the 12 vocatur (named) stars

No.	$t$					
	1	5	10	15	18	21
110	37.6	21.2	<u>0.9</u>	19.3	31.4	43.3
818	23.6	18.3	11.7	<u>5.1</u>	<u>1.2</u>	<u>2.6</u>
288	<u>8.6</u>	<u>9.4</u>	10.5	11.8	12.6	13.4
509	13.0	14.3	15.8	17.1	17.8	18.4
553	32.6	29.5	25.5	21.6	19.3	17.0
452	30.5	28.5	25.9	23.2	21.5	19.8
848	11.2	16.0	21.9	27.6	31.1	34.4
469	17.5	16.6	15.4	14.0	13.0	12.1
510	<u>2.4</u>	<u>0.7</u>	<u>1.3</u>	<u>3.1</u>	<u>4.2</u>	<u>5.2</u>
149	15.4	14.2	12.5	10.8	<u>9.8</u>	<u>8.7</u>
222	21.9	21.7	21.3	21.0	20.8	20.6
892	51.0	54.2	58.2	62.3	64.8	67.3

The values  $t = 18$  and  $t = 21$  correspond almost exactly to the traditional dates for the lives of Ptolemy and Hipparchus. (Recall that some experts attribute the Almagest to Hipparchus.) Table 1 confirms that it is senseless to date a catalogue using the "exact minimum" of some usual distance between stars or between star configurations. The value  $t_0$  as the absolute minimum of a distance is very "sensitive" to small variations in the initial data.