A PASKAL 7 PACKAGE

S P E L

U S E R ' S I N F O

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INTERACTIVE ORBITAL SOLUTIONS FOR SB1 OR SB2 BINARIES

©: Jiří Horn,[1]

Prepared with the permission of wife of Dr. Jiří Horn Mrs. Jiřina Hornová
by Petr Harmanec
Astronomical Institute of the Charles University,
V Holešovičkách 2, CZ-180 00 Praha 8, Czech Republic

FAX (420)-221 912 577 **Telephone: (420)-283 072 573**

e-mail: hec@sirrah.troja.mff.cuni.cz

[1] Dr. Jiří Horn died on Dec. 13, 1994

Foreword

Program SPEL has been developed by the late Dr. Jiří Horn at the Stellar Department of the Astronomical Institute of Academy of Sciences in Ondřejov. The first version (which still exists) was controlled by various keys in a contol file. The current version is interactive and user-friendly and is ideal for the newcomers to the field. This is the reason why I displayed this new version, with permission, on our ftp server to make it available to our students and other interested people. The program can be run under DOS or Windows environment.

Since a detailed description of this program has never been published, please refer to the papers by Horn et al. (1994, 1996), where this program was previosly used should you use SPEL in any future publication.

The programs and data files described here can be obtained via anonymous

http://astro.mff.cuni.cz/ftp/hec/spel90 .

1 PURPOSE, SAMPLE INPUT FILE, AND LITERATURE

The program derives orbital solution for simple single-line or double-line binaries. Both circular-orbit and eccentric orbit solutions are possible. For an eccentric orbit, the test by Lucy and Sweeney for the reality of the eccentricity is automatically provided. A graphical display of the fit is available. Different systemic velocities can be derived for different spectrographs. The user only supplies the data in a fixed format. The trial orbital elements are read interactively. The input file must have an extension *spd* and contains one record of the text (star name for instance) and records with the observed RJDs=HJDs-2400000.0 and RVs, weights and numerical codes for different spectrographs and binary components (1 or 2). A test example is shown below. Different systemic velocities are allowed for for the primary and secondary but user can also ask for a common one. Fix the orbital period at 4.30216 and you can try different options, start with T = 56789.

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        10        20        30        40        50        60        70        80
....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|

HJD-2400000    RV       weight  spg. component
56744.5862  -92.348     1.000     1    1
56746.4816   64.124     1.000     1    1
56764.4510   11.104     1.000     1    1
56765.4209  -89.640     1.000     1    1
56778.4182  -93.594     1.000     1    1
56782.5511  -85.191     1.000     1    1
56799.5499  -67.168     1.000     1    1
56815.5215   60.040     1.000     1    1
56816.3854  -25.600     1.000     1    1
56817.4476 -100.428     1.000     1    1
56819.3930   62.050     1.000     1    1
56822.4202  -61.021     1.000     1    1
56826.4377  -87.968     1.000     1    1
56827.5433   30.550     1.000     1    1
56744.5862   90.419     1.000     2    2
56746.4816 -143.629     1.000     2    2
56764.4510  -63.786     1.000     2    2
56765.4209   91.767     1.000     2    2
56778.4182   94.652     1.000     2    2
56782.5511   73.051     1.000     2    2
56799.5499   58.369     1.000     2    2
56815.5215 -135.344     1.000     2    2
56817.4476  101.329     1.000     2    2
56819.3930 -137.810     1.000     2    2
56822.4202   43.773     1.000     2    2
56826.4377   80.037     1.000     2    2

....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|
        10        20        30        40        50        60        70        80
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References

[1] Horn J., Koubský P., Hadrava P. 1994 A&AS 105, 119

[2] Horn J., Kubát, Harmanec P. et al. 1996 A&A 309, 521

[3] Lucy L.B., Sweeney M.A. 1971 AJ 76, 544