

Introduction on ILRS SHAO Analysis Center and Products

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Xiaoya Wang, Bing He, Qunhe Zhao, Bin Wu, Xiaogong Hu, Weijing Qu

1. Shanghai Astronomical Observatory, Chinese Academy of Sciences, 80 NanDan Road, Shanghai 200030, China. Email: wxy@shao.ac.cn

Abstract

SHAO (ShangHai Astronomical Observatory) SLR Analysis Center of The International Laser Ranging Service (ILRS) has established an internet website for SLR products. It published ILRS SHAO ACC and AC products. The ILRS SHAO ACC products include its quick-look processing results such as range and time biases and also the measure errors based on different satellites. The present processed satellites include Lageos-1/2, Etalon-1/2 and LARES. If there is any necessary for other satellites we can also process their SLR data. The ILRS SHAO ACC products also include the residual status and orbit products. ILRS SHAO AC products included SLR SINEX solutions and geocentric motion products. We will not only provide SLR combined solution based on different ILRS AC solutions and also compare our combined solution with ILRS combined solutions.

1 Motivation

SLR is one of Space geodesy techniques and basis for The Terrestrial Reference Frame(TRF) and EOP. It can also provide the orbits of satellites and geocentric motion with cm order accuracy. The International Laser Ranging Service (ILRS) provides global satellite and lunar laser ranging data and their related products to support geodetic and geophysical research activities as well as IERS products important to the maintenance of an accurate International Terrestrial Reference Frame (ITRF). We are also ILRS AAC. Therefore, we hope we can do more contribution to ILRS. So, a system ILRS ACC products has been publishing by SHAO CERS website. A systematic required ILRS AC products will be published including loosely weekly SINEX solutions, geocentric motion, EOP, SLR site coordinate and velocity. In future we will study combining different ILRS ACC and AC solutions and provide their comparison status for SLR users.



2 Methods

We adopted SHODE-I and COMPASS software packages developed by SHAO SLR data analysis group. We have modified some models according to IERS 2010 Conventions and still need such modification to improve products. In future we will develop the combination software based on different ILRS ACC and AC solutions.

3 Results

In our ILRS AAC products part, firstly we publish the sum of SLR observation and orbit determination rms for different satellites. See figure 1. And then publish Comparison of Range and time Biases from Different Analysis Centers(see figure 2). Finally we provide products directory for

Figure 4. Geocentric motion time series.



orbits and biases report for downloading.

In our SLR AC products part, we compare our results with ITRF2008 and IERS C04. Figure 3 shows the statistics of the SLR position and velocity differences of our solutions with respect to ITRF2008 and EOP results w.r.t IERS C04. We also show Geocentric motion results (see figure 4) and provide products directory of weekly SINEX solutions for downloading. Figure 5 shows our website. Those products have been constructed in different ways to show in our website step by step.



Figure 1. Sum of SLR observation and orbit determination rms (Lageos-1)



· CERS Bulletin A (rapid EOP data and predictions) · EOP 08 CO4 (IAU1980) - one file (1962-now)

DATA / PRODUCTS

Geophysical Fluids Data

SHAO TRF/TRS

EOPs

VLBI AC

SLR AC

GNSS AC

DORIS AC

iGMAS AC

Gravity

SLR ANALYSIS CENTER INTRODUCTION

Satellite Laser Ranging(SLR) data Analysis Center(AC) mainly works for two modules, quick processing and post processing of SLR data.

The quick processing module processes and analyzes the all observations of global SLR stations weekly and give the quality assessment. At the same time, calculates the satellite orbits and Earth Orientation Parameters(EOP), then preprocesses the data with the elimination of burst noise to generate a new SLR MERIT-II format file. The post processing module primarily achieves precise orbit, EOP, the precise coordinate and velocity of stations, the post monthly or annual changing of earth's mass center, especially generates the products of coordinate time series of concatenation stations, the orbits of a variety of satellite including GPS and SLR observations and motion time series of earth's mass center. All these are the SLR characteristic products and we will provide the SINEX format results. The software also has automatic and manual running and processing functions, and provide for visualization of some results.

• The quality of observation data

- The quality and residuals of satellites' orbit
- The time and range bias of stations

Leader: WANG Xiaoya (wxy@shao.ac.cn)

Member: WU Bin, HU Xiaogong, HE Bing, QU Weijing, ZHAO Qunhe, SHAO Fan

Figure 5. SLR Analysis Center website: <u>http://cers.shao.ac.cn/en/data-products/slrcentre-en.html</u>.

Welcome to send us your opinions and suggestions.

4 Conclusion and future plans

6 References

SHAO SLR AC has provided some ILRS ACC Altamimi Z., Collilieux X., Metivier L.: ITRF2008: an





Figure 3. Statistic of the position and velocity differences with respect to ITRF2008 (**up** left) and EOP results w.r.t IERS C04 for Px (Up right), Py (**down** left), LOD (**down** right)).

products such as orbit, orbit determination rms, statistic of observation data and range and time biases by SHAO CERS website. In SLR AC products area we can provide weekly loosely SLR SINEX EOP and coordinate solutions. Meanwhile, we also publish our combined SLR site coordinate and velocity and their comparison with ITRF products. And also publish EOPs and their comparison with IERS C04. Finally we will also publish geocentric motion time series in AC products area. We will provide SLR combined solution based on different ILRS AC solutions and their comparison status in future.

5 Acknowledgments

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