Deliverable 3.2: Complete implementation of listed data bases and tools

Abstract:
This document describes the Seismic Plus portal and provides a short description of its main functionalities.

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Editors: Kévin Belkacem
Contributors: Christian Renié, Eric Michel

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Introduction

The Seismic Plus portal is already open since June 2016 (see deliverable 3.3) and has been made available at the following URL: http://voparis-spaceinn.obspm.fr/seismic-plus/

The portal allows us to explore the full range of its functionalities (access to a standard description of existing data and data sources; localization of existing data for a given star or star list via the query interface; quick-look tools are available for a first inspection of the data; possibility to coordinate and transmit a data query to the various sources in order to download the relevant data). The access has been implemented for the set of data sources within the list established in the document “Set of data access and tools to be implemented” (deliverable D3.1).

Since the last reporting, new data sources have been included, namely;

SISMA (http://sisma.brera.inaf.it/)
GAUDI (http://sdc.cab.inta-csic.es/gaudi/)
KASOC (http://kasoc.phys.au.dk/)

Virtual Observatory (VO) tools and interfaces have been used as much as possible. Compared to the early version of the portal, 2016 was also dedicated to the definition and development of the global helioseismic part of the portal. Based on VO interfaces of solar and events catalogs such as HELIO, VSO, and JSOC, a prototype has been developed and extensively tested. Finally, a first version has been implemented in the portal.

Access to the Seismic Plus portal

The Seismic Plus portal is now open (Fig. 1) and available through the following url:

http://voparis-spaceinn.obspm.fr/seismic-plus/
**Data sources description**

As described in the deliverable 3.1 and 3.3, an extensive list of data source descriptions is available and sorted out following the type of considered data, namely; Times series, Spectroscopy/Individual spectra, Stellar parameters, Other.

Two levels of data description have been implemented;

- A synthetic view (Fig. 2) of all data sources of a given type providing the name of the considered instrument, the data types, and the data access options.

- For each data source, a detailed description (Fig. 3) is provided and allows an in-depth view of the content of the source. Note that the detailed description is provided only when available.
Fig. 2: Synthetic data sources description page of the Seismic Plus portal

Fig. 3: Detailed data sources description page of the Seismic Plus portal

Query forms
The main tool of the portal is to provide a simple view to the available data for The Sun, a given star, or a given list of stars. This is provided through the “Data query” page (Fig. 4a,b).

As displayed by Fig. 5 for the stars, the page that exhibits the results of the query allow the user to have the full view of the available data for each considered star in a synthetic way. The selection of a given star also permits the user to obtain a comprehensive view as well as an easy access to the available data (Figs. 6 & 7). Finally, tools have been developed to handle data and to provide seismic estimates of stellar parameters (masses, radii) from seismic indices. This is displayed in Fig. 8.

Fig. 4: Data query pages of the *Seismic Plus* portal for the stars (top panel) and the Sun (bottom panel).

Fig. 5: Result page of the *Seismic Plus* portal
Fig. 6: Result page of the Seismic Plus portal for the star KIC11287896 providing the stellar parameters and the seismic indices.
Fig. 7: Result page of the Seismic Plus portal for the star KIC11287896 providing the light curves (top panel) and a tool that provides an interactive view of a selected light curve (bottom panel).
Fig. 8: Tools that provides estimates of masses and radii from seismic indices based on scaling relations. The top panel displays the selection of the stars and of the tool to compute the stellar parameters and the bottom panel shows the results.
For the Sun, the page that exhibits the results of the query allows the user to have the full view of the available data. More precisely, it gives access to the time-series and the events (Figs. 9).

**Fig. 9:** Result page of the *Seismic Plus* portal for the Sun. The top panel provides the result page for the
timeseries and the bottom panel provides the result page for the events.