

SPACEINN/WP3, Data Handling and Archiving

Deliverable D3.11

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18/12/2013

One of the activities under WP3 is the upgrade of existing data bases. One of the major resources for asteroseismology is the Kepler asteroseismic data archive. Kepler data are made available to the Kepler Asteroseismic Science Consortium (KASC) members through the Kepler Asteroseismic Science Operations Centre (KASOC) in Aarhus for each star in KASOC, in a well certified and documented way.

One of the activities under SpaceInn is to secure full integration of the supplementary data which is available.

In the first year of the Project a preliminary inclusion of coordinated ground-based data within KASOC has been conducted. Spectroscopic ground-based data of about 103 red-giant stars in the Kepler field, observed by Thygesen et al. (2013) with the FIES (Fibre-fed Echelle Spectrograph) instrument at the Nordic Optical Telescope, have been ingested into the KASOC database. The current test phase includes so-called merged (with respect to spectral order) stellar spectra in (binary) FITS format of 103 red giant stars. These FITS files are "linked" to the appropriate existing photometric Kepler data and to stellar information already available in the KASOC database.

In addition, meta-data on other existing ground-based observations exist in the data base, too.

These ground-based data were made available via the KASOC web-interface (<http://kasoc.phys.au.dk>) before the end of December 2013.

The following figures explain how these data sets can be accessed. After login to the KASOC the implemented data sets can be found on the welcome screen (Fig.1) under the tab "Ground-Based". After opening this tab search facilities allow finding information on stellar objects for which ground-based complementary observations are available (Fig. 2). The search can be carried out either by

- Objects: classification, star name, or KIC number (Fig. 3)
- Observation: classification in combination with observation type (photometry, spectroscopy, spectropolarimetry, interferometry), instrument, and time frame (Fig. 4)
- KIC parameters, which include ranges for the position on the sky, stellar parameters like radius and log g, and various magnitudes (Fig 5).
- And all possible combinations of the above (Fig. 6)

The meta data for the search results are listed after clicking on the "Search" button (Fig. 7). The image shows the current table of offered information about ground-based follow-up

observations, which include information about the observed star, the observer and the instrument used for the listed observation(s). An additional column will provide the necessary link to the actual observational data in FITS format. Data can then either finally be downloaded from KASOC, or the PI of the observation campaign can be contacted by e-mail.

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Kepler Asteroseismic Science Operations Center

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Welcome Markus Roth

News

15th Nov 2013: Q12 updated.
Additional stars are included in the latest Q12 (Data Release 21) dataset. The data were processed with PDC msMAP. Please read the release notes for DR 21: http://kasoc.phys.au.dk/docs/release_notes/Data_Release_Notes_21_20130508.pdf.

12th Nov 2013: Q16 is available for download.
Both the "FITS" and "ASCII" formats of Q16 (Data Release 22), together with the TPD files (also as bundles) are available for download. Please consult the associated release notes, which are available in the Information - Documentation section.

29th Aug 2013: KASOC Scheduled Downtime
During the next few days (Thursday and Friday) there may be times where the KASOC website is unavailable in periods. This is due to some maintenance of the systems. We apologize for any inconvenience this may cause, and will try to keep the downtime to a minimum.

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Kepler News

11th Dec 2013: Kepler Mission Manager Update: Invited to 2014 Senior Review
The Astrophysics Division at NASA Headquarters has invited the Kepler project to submit a funding proposal for a two-wheel mission, dubbed K2, to its 2014 Senior Review of operating missions.
[Read more](#)

4th Dec 2013: NASA STATEMENT: Two-Wheel Kepler Mission Invited to 2014 Senior Review
NASA has invited Kepler to the 2014 Senior Review to propose for funding for a two-wheel mission, dubbed K2.
[Read more](#)

26th Nov 2013: Kepler's Second Light: How K2 Will Work
The conception illustration depicts how solar pressure can be used to balance NASA's Kepler spacecraft, keeping the telescope stable enough to continue monitoring distant stars in search of transiting planets. In May, Kepler lost the second of four gyroscope-like reaction wheels, ending new data collection for the original mission. A new mission concept, dubbed K2, would continue Kepler's search for other worlds, and introduce new opportunities to observe star clusters, young and old stars, active galaxies and supernovae. Using the sun and the two remaining reaction wheels, engineers have devised an innovative technique to stabilize and control the spacecraft in all three directions of motion. This technique of using the sun as the 'third wheel' to control pointing is currently being tested on the spacecraft. To achieve the necessary stability, the orientation of the spacecraft must be nearly parallel to its orbital path around the sun, which is slightly offset from the ecliptic, the orbital plane of Earth. The ecliptic plane defines the band of sky in which lie the constellations of the zodiac. K2 would study a specific portion of the sky for up to 83 days, until it is necessary to rotate the spacecraft to prevent sunlight from entering the telescope. Each orbit or year would consist of approximately 4.5 unique viewing periods or campaigns. The K2 mission concept has been presented to NASA Headquarters. A decision to proceed to the 2014 Senior Review – a biannual assessment of operating missions – and propose for budget to fly K2 is expected by the end of 2013. Image credit: NASA Ames/W Stenzel
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Publications

In KASC review

- Patrick Gaulme: Surface Activity and Oscillation Amplitudes of Red Giants in Eclipsing Binaries
Status: In KASC review. Deadline: Thu 19th December 2013.
- L. Casagrande: Strömgren survey for Asteroseismology and Galactic Archaeology: let the SAGA begin
Status: In KASC review. Deadline: Fri 20th December 2013.
- T. Appourchaux: Oscillation mode linewidths and heights of 23 main-sequence stars observed by Kepler
Status: In KASC review. Deadline: Fri 20th December 2013.
- Zs. Bognár: KIC 9533489: a genuine gamma Doradus - delta Scuti Kepler hybrid pulsator showing transit-like events
Status: In KASC review. Deadline: Tue 24th December 2013.
- J. F. Le Borgne: The historical vanishing of the Blazhko effect of RR Lyr from GEOS and Kepler surveys
Status: In KASC review. Deadline: Wed 25th December 2013.

Recently published or submitted

- P. G. Beck: Pulsating red giant stars in eccentric binary systems discovered from Kepler space-based photometry - A sample study and the analysis of KIC 5006817
Status: Accepted. Updated: Tue 17th December 2013 17:28.
- A. Derezas: Period and light curve fluctuations of the Kepler Cepheid V1154 Cyg
Status: Published. Updated: Fri 13th December 2013 17:28.
- K. Hambleton: KIC 4544587: an Eccentric, Short Period Binary System with delta Scuti Pulsations and Tidally Excited Modes
Status: Ready for submission.
- S. Mathur: Magnetic activity of F stars observed by Kepler
Status: Submitted. Updated: Tue 10th December 2013 21:03.
- R. A. Garcia: Impact on asteroseismic analyses from regular gaps in Kepler data
Status: Ready for submission.
- Alexandra Fogtman-Schulz: Accurate parameters of the oldest known rocky-exoplanet hosting system: Kepler-10 revisited
Status: Accepted. Updated: Tue 10th December 2013 09:31.
- V. Silva Aguirre: Old puzzle, new insights: a lithium rich giant quietly burning helium in its core
Status: Ready for submission.

For any comments contact Günter Houdek

Figure 1: Welcome Screen of the Kepler Asteroseismic Science Operation Center at: <http://kasoc.phys.au.dk>

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Kepler Asteroseismic Science Operations Center

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Ground-Based

Below you will find the database of all the ground based support observations that have been performed by the members of KASC on Kepler targets. You can use the search facilities below to find information about what observations have been performed on your favorite target and, if necessary, who to contact in order to get the data or results from the observations.

If you have observed a target, please add it to the database by going to the upload-section by clicking the link in the menu to the right.

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Observations database

[Objects](#) [Observation](#) [KIC parameters](#)

Classification:

*Please search the database using the form above.
If all fields are left at the default, all observations will be shown (note that this will create a very long table).*

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Figure 2: the search facility for finding ground-based observations.

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Observations database

[Objects](#)[Observation](#)[KIC parameters](#)

Classification:

Red Giant star

Star name:

KIC-10 number:
(One per line)

 Search

*Please search the database using the form above.
If all fields are left at the default, all observations will be shown (note that this will create a very long table).*

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Figure 3: Search by Objects.

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Observations database

Objects	Observation	KIC parameters
Classification:	<input type="text" value="Red Giant star"/>	
Ordered by:	<input checked="" type="checkbox"/> None <input checked="" type="checkbox"/> 1 - Solar-like Oscillations <input checked="" type="checkbox"/> 2 - Oscillating stars in open clusters <input checked="" type="checkbox"/> 3 - Main Sequence "classical" pulsators <input checked="" type="checkbox"/> 7 - RR Lyrae stars and Cepheids <input checked="" type="checkbox"/> 8 - RGB oscillations <input checked="" type="checkbox"/> 11 - Compact pulsators <input checked="" type="checkbox"/> 12 - Mira- and Semi-regular variables <input checked="" type="checkbox"/> 14 - Public Outreach and public KASOC webpage	
Observation type:	<input checked="" type="checkbox"/> Photometry <input checked="" type="checkbox"/> Spectroscopy <input checked="" type="checkbox"/> Spectropolarimetry <input checked="" type="checkbox"/> Interferometry	
Instrument:	<input type="text"/>	
Obtained:	<i>From:</i> <input type="text"/>	<i>To:</i> <input type="text"/>
<input type="button" value="Search"/>		

Please search the database using the form above.
If all fields are left at the default, all observations will be shown (note that this will create a very long table).

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Figure 4: Search by Observation.

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If you have observed a target, please add it to the database by going to the upload-section by clicking the link in the menu to the right.

Observations database

Objects	Observation	KIC parameters
Classification:	Red Giant star	<input type="text"/>
RA:	18:38:52 - 19:54:31	<input type="range"/>
Dec:	41:03:49 - 50:19:34	<input type="range"/>
Magnitude:	5.54544 - 20.67	<input type="range"/>
Teff:	5247.903 - 18218.303	<input type="range"/>
log G:	-0.11306 - 4.26952	<input type="range"/>
Radius:	14.0757 - 263.92701	<input type="range"/>
[Fe/H]:	-0.8177 - 0.29103	<input type="range"/>
E(B-V):	0.11476 - 0.39604	<input type="range"/>
A(V):	0.0655 - 1.491	<input type="range"/>
Contamination:	0.046 - 0.846	<input type="range"/>
u Mag:	14.35547 - 17.91857	<input type="range"/>
g Mag:	5.29479 - 21.54	<input type="range"/>
r Mag:	5.05126 - 19.24032	<input type="range"/>
i Mag:	7.53575 - 12.88073	<input type="range"/>
z Mag:	10.0905 - 14.89951	<input type="range"/>
gred Mag:	8.92504 - 18.622	<input type="range"/>
D51 Mag:	7.66578 - 19.014	<input type="range"/>
J Mag:	4.3654 - 13.39504	<input type="range"/>
H Mag:	0.60532 - 7.60484	<input type="range"/>
K Mag:	1.77498 - 16.9582	<input type="range"/>

Please search the database using the form above.
If all fields are left at the default, all observations will be shown (note that this will create a very long table).

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Figure 5: Search by KIC parameters.

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Observations database

Objects	Observation	KIC parameters
Classification:	Red Giant star	
Star name:	<input type="text"/>	
KIC-10 number: (One per line)	<input type="text"/>	
Ordered by:	<input checked="" type="checkbox"/> None <input checked="" type="checkbox"/> 1 - Solar-like Oscillations <input checked="" type="checkbox"/> 2 - Oscillating stars in open clusters <input checked="" type="checkbox"/> 3 - Main Sequence "classical" pulsators <input checked="" type="checkbox"/> 7 - RR Lyrae stars and Cepheids <input checked="" type="checkbox"/> 8 - RGB oscillations <input checked="" type="checkbox"/> 11 - Compact pulsators <input checked="" type="checkbox"/> 12 - Mira- and Semi-regular variables <input checked="" type="checkbox"/> 14 - Public Outreach and public KASC webpage	
Observation type:	<input checked="" type="checkbox"/> Photometry <input checked="" type="checkbox"/> Spectroscopy <input checked="" type="checkbox"/> Spectropolarimetry <input checked="" type="checkbox"/> Interferometry	
Instrument:	<input type="text"/>	
Obtained:	From:	To:
	<input type="text"/>	<input type="text"/>
RA:	18:38:52 - 19:54:31	<input type="range"/>
Dec:	41:03:49 - 50:19:34	<input type="range"/>
Magnitude:	5.54544 - 20.67	<input type="range"/>
Teff:	5247.903 - 18218.303	<input type="range"/>
log G:	-0.11306 - 4.26952	<input type="range"/>
Radius:	14.0757 - 263.92701	<input type="range"/>
[Fe/H]:	-0.8177 - 0.29103	<input type="range"/>
E(B-V):	0.11476 - 0.39604	<input type="range"/>
A(V):	0.0655 - 1.491	<input type="range"/>
Contamination:	0.046 - 0.846	<input type="range"/>
u Mag:	14.35547 - 17.91857	<input type="range"/>
g Mag:	5.29479 - 21.54	<input type="range"/>
r Mag:	5.05126 - 19.24032	<input type="range"/>
i Mag:	7.53575 - 12.88073	<input type="range"/>
z Mag:	10.0905 - 14.89951	<input type="range"/>
gred Mag:	8.92504 - 18.622	<input type="range"/>
D51 Mag:	7.66578 - 19.014	<input type="range"/>
L Mag:	1.00000 - 10.00000	<input type="range"/>

Figure 6: Combination of all three search options.

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If you have observed a target, please add it to the database by going to the upload-section by clicking the link in the menu to the right.

Observations database

Objects	Observation	KIC parameters								
Classification: <input type="text" value="Solar-like star"/>										
<input type="button" value="Search"/>										
KIC	RA	Dec	Mag	Instrument	Obtained	WorkGroup	Number	Observer	Contact	Remarks
10273246	19:26:05.76	47:21:30.1	10.903	FIES_LOW	04-08-2013		1	Anders Overaa Thygesen	Anders Overaa Thygesen	
11395018	19:09:55.49	49:15:04.5	10.762	FIES_LOW	03-08-2013		1	Anders Overaa Thygesen	Anders Overaa Thygesen	
10920273	19:27:45.77	48:19:45.4	11.926	WFC	21-07-2011	1	1	Joanna Molenda-Zakowicz	Katrien Uytterhoeven	
12069449	19:41:51.98	50:31:03.1	6.095	NARVAL_SPEC	27-09-2010		1	Service	Katrien Uytterhoeven	
12069449	19:41:51.98	50:31:03.1	6.095	CS23	25-07-2010		1	2 Katrien Uytterhoeven	Peter De Cat	
3733735	19:09:01.92	38:53:59.6	8.368	SES	28-06-2010	1, 4, 10	3	Peter De Cat	Peter De Cat	
3733735	19:09:01.92	38:53:59.6	8.368	SES	22-06-2010	1, 4, 10	3	Peter De Cat	Peter De Cat	
10273246	19:26:05.76	47:21:30.1	10.903	BCSPM	18-06-2010		1	Lester Fox Machado	Lester Fox Machado	
11395018	19:09:55.49	49:15:04.5	10.762	BCSPM	18-06-2010		1	Lester Fox Machado	Lester Fox Machado	
10273246	19:26:05.76	47:21:30.1	10.903	DANISH_SPM	13-06-2010		1	Lester Fox Machado	Lester Fox Machado	
11395018	19:09:55.49	49:15:04.5	10.762	DANISH_SPM	13-06-2010		1	Lester Fox Machado	Lester Fox Machado	
3733735	19:09:01.92	38:53:59.6	8.368	CAMELOT	01-06-2010	1, 4, 10	1	Katrien Uytterhoeven	Katrien Uytterhoeven	
3733735	19:09:01.92	38:53:59.6	8.368	DANISH_OSN	01-06-2010	1, 4, 10	1	Susana Martin-Ruiz	Susana Martin-Ruiz	
10273246	19:26:05.76	47:21:30.1	10.903	WFC	31-05-2010		1	Joanna Molenda-Zakowicz	Katrien Uytterhoeven	
10920273	19:27:45.77	48:19:45.4	11.926	WFC	31-05-2010		1	Joanna Molenda-Zakowicz	Katrien Uytterhoeven	
11234888	19:07:00.22	48:56:07.0	11.926	WFC	31-05-2010		1	Joanna Molenda-Zakowicz	Katrien Uytterhoeven	
11395018	19:09:55.49	49:15:04.5	10.762	WFC	31-05-2010		1	Joanna Molenda-Zakowicz	Katrien Uytterhoeven	
3733735	19:09:01.92	38:53:59.6	8.368	ESPADONS	01-04-2010	1, 4, 10	1	Service	Hans Bruntt	
8006161	18:44:35.16	43:49:59.9	7.364	ESPADONS	01-04-2010		1	Service	Hans Bruntt	
3632418	19:09:26.83	38:42:50.5	8.224	NARVAL_SPEC	01-03-2010		1	Service	Hans Bruntt	
8006161	18:44:35.16	43:49:59.9	7.364	NARVAL_SPEC	01-03-2010		1	Service	Hans Bruntt	
3632418	19:09:26.83	38:42:50.5	8.224	FRESCO	01-09-2009		1	Joanna Molenda-Zakowicz	Joanna Molenda-Zakowicz	
3733735	19:09:01.92	38:53:59.6	8.368	FRESCO	01-09-2009	1, 4, 10	1	Joanna Molenda-Zakowicz	Joanna Molenda-Zakowicz	
3733735	19:09:01.92	38:53:59.6	8.368	SOPHIE	04-08-2009	1, 4, 10	2	Katrien Uytterhoeven	Philippe Mathias	
3632418	19:09:26.83	38:42:50.5	8.224	FIES_LOW			1	Service	Anders Overaa Thygesen	
3733735	19:09:01.92	38:53:59.6	8.368	FIES_LOW		1, 4, 10	1	Service	Anders Overaa Thygesen	
8006161	18:44:35.16	43:49:59.9	7.364	PAVO			1	Daniel Huber	Daniel Huber	

Figure 7: Search result. Excerpt of the list of meta information of ground-based observations of solar-type stars already included in the database.