

VO-KOREL: A Fourier disentangling service of Virtual Observatory

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<http://stelweb.asu.cas.cz/vo-korel>

LIVE DEMO

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Abstract
VO-KOREL is a web service exploiting the technology of Virtual Observatory for providing the astronomer with the intuitive graphical frontend and distributed computing backend running the most recent version of Fourier disentangling code KOREL.

The system integrates the ideas of-- the e-shop basket, conserving the privacy of every user by transfer encryption and access authentication, with features of laboratory notebook, allowing the easy housekeeping of both input parameters and final results, as well as it explores a newly emerging technology of cloud computing.

While the web-based frontend allows the user to submit data and parameter files, edit parameters, manage a job list, attach to cancel running jobs and mainly watching the text and graphical results of a disentangling process, the main part of the backend is a simple job queue submission system receiving in parallel multiple instances of FORTRAN code KOREL. This may be easily extended for GRID-based deployment on massively parallel computing clusters.


The practical usage of VO-KOREL will be shown in a short live demo.

Technological background
VO-KOREL is based on one of the standards of Virtual Observatory - the Universal Worker Service (UWS) allowing complex workflows to be deployed on the distributed computer nodes or GRID. Currently it runs in the virtualized environment on several virtual servers in Stellar Department of the Astronomical Institute in Ondřejov. The communication with the users is protected by the SSL strips, protocol requiring the simple user registration similar to the e-shop system. The user sees only his own jobs and results of his previous computations very similar to the e-cart contents.

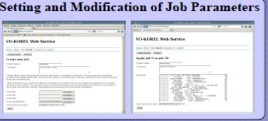
The UWS schema re-exploits the RestfulWeb Service Internet technology based on REST concept (Representational State Transfer) - uses virtual URI and basic http protocol actions (PUT, GET, POST, DELETE) to control jobs or manipulating input parameters and outputs in UWS.

This system may be as well considered to be a scientific toolset of a new IT paradigm called Cloud Computing strongly pushed by IT leaders like Microsoft, Amazon or Google under the terms „Software as a Service“. The main idea of cloud computing is based the powerful computer infrastructure of distributed (super) computers and the simple web browser appliances like mobile phones or smart terminals communicating and controlling the computation through simple web forms with embedded buttons and images.

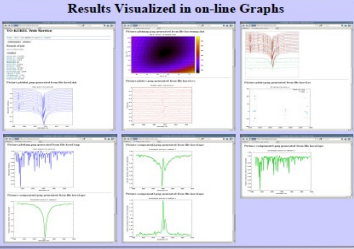
Registration of a New User



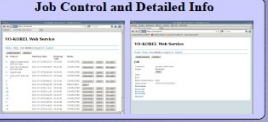
Setting and Modification of Job Parameters



Results Visualized in on-line Graphs



Job Control and Detailed Info



The VO-KOREL provides an effective environment for Fourier disentangling of number of different spectra sets, combining the easy web-based user interaction with the powerful background job queue submission and load balancing system. It is easily scalable with user demands and extendable towards the GRID-based distributed computing platforms.

<http://stelweb.asu.cas.cz/vo-korel>

Acknowledgments
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VO-KOREL

- Virtual Observatory
 - Huge data, processing on (super)computer GRIDs
 - Web Services (e-shop, reservation system)
- VO-KOREL
 - Environment for running KOREL as WS
 - Job control (each user 5 jobs, other queued)
 - Visualisation
 - Parametr editing (cut and paste)

VO-KOREL

First version 2009

So far 65 registered users

30 computed ~500 jobs

Web browser on slow appliances (mobile phone)

Cloud computing (Software as service)

General – e.g. model atmospheres (VO-TLUSTY?)