VO-KOREL: A Fourier disentangling service of Virtual Observatory

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Abstract

VO-KOREL is a web service exploiting the technology of Virtual Observatory for providing the astronomers 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, resubmit or 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 executing 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.

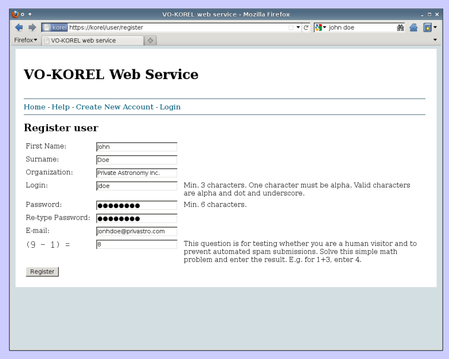
Technological background

VO-KOREL is based on one of the 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 https 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.

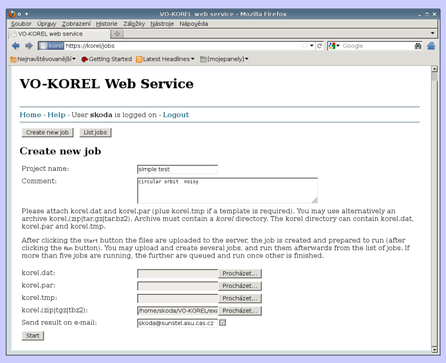
The UWS schema re-exploits the RestfulWeb Service Internet technology based on REST concept (REpresentational State Transfer) – uses virtual URI and basic http protocol actions (PUT, GET, POST, DELETE) to control jobs or manipulating input parameters and outputs in UWS.

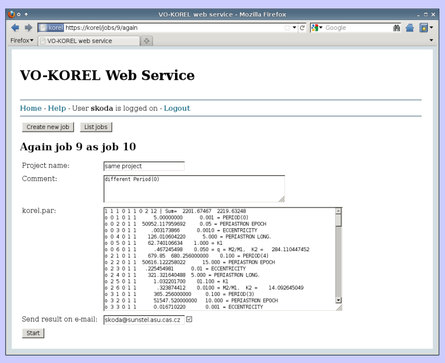
This system may be as well considered to be a scientific testbed of a new IT paradigma called Cloud Computing, strongly pushed by IT leaders like Microsoft, Amazon or Google under the terms „Software as a Service“ . The main idea of cloud computing is based the poweful computer infrastructure of distributed (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

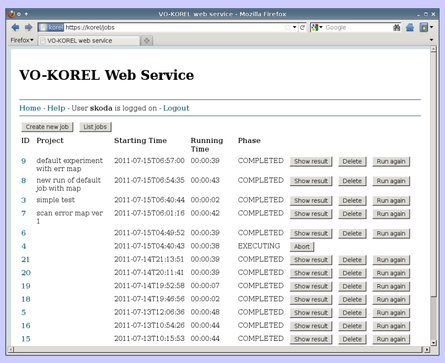


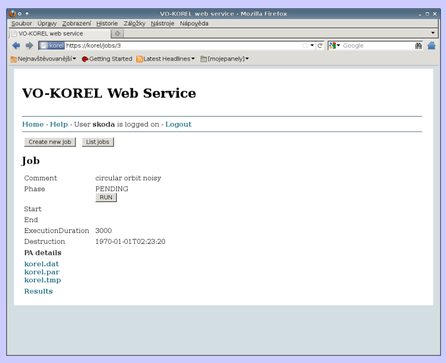
Setting and Modification of Job Parameters



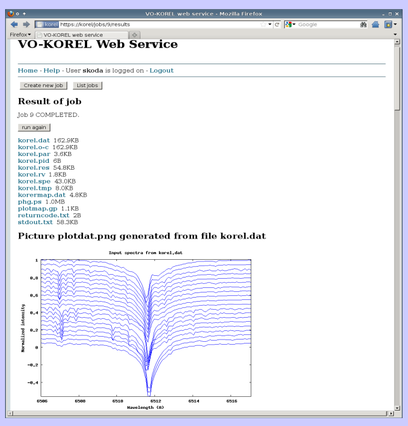


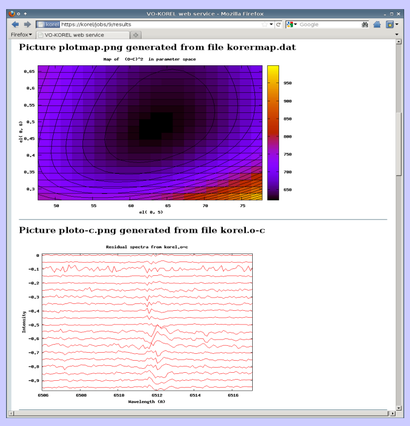
Job Control and Detailed Info

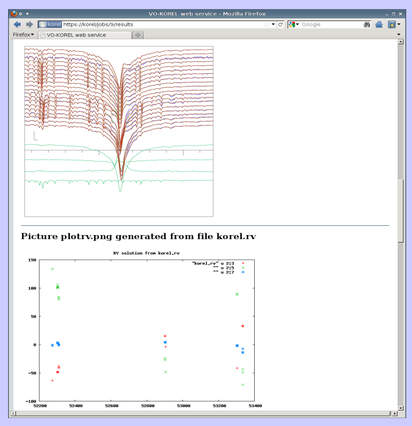


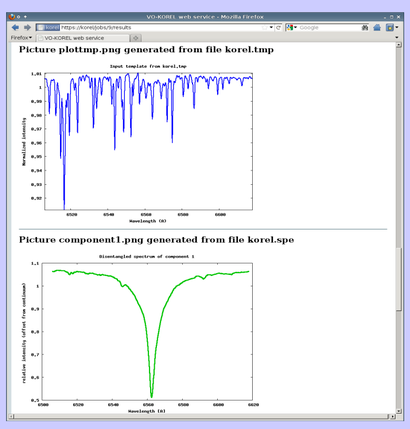


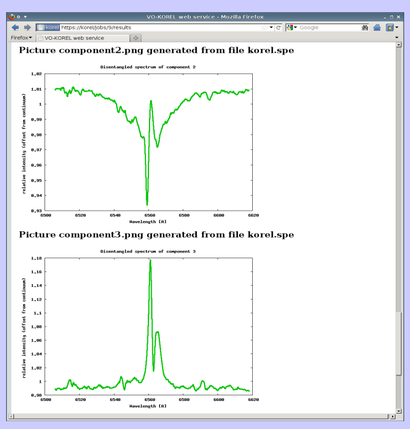
Results Visualized in on-line Graphs

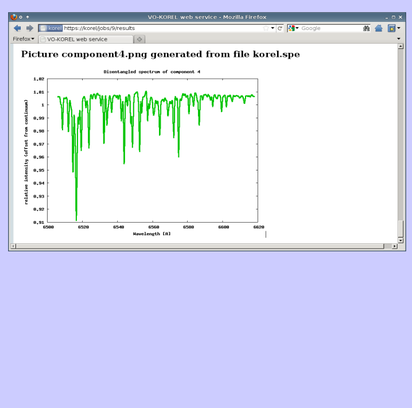












The VO-KOREL provides an effective environment for Fourier disentangling of number of different spectra sets, combining the easy web-based user interaction with the powerful background job queue submission and load balancing system. It is easily scalable with user demands and extensible towards the GRID-based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

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

Acknowledgments
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