Integration of Standalone CVM-H Basin Models into the Unified Community Velocity Model (UCVM) Software

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The SCEC Unified Community Velocity Model (UCVM) software offers a standardized interface to query and process regional seismic velocity models. Earth properties (Vp, Vs, and density) can be queried from UCVM registered velocity models by latitude, longitude and depth.

In the latest release of UCVM, there are ten 3D seismic velocity models, two 1D seismic velocity model and nine sedimentary basin models which include a basement surface and velocity structure as available with CVM-H v15.1 (Plesch et al., 2021)

These detailed basin models are incorporated into UCVM as standalone models with the possibility to embed these basin models into other large-scale regional models. Users can easily create new composite velocity model with new basin information using UCVM’s tiling functionality.

UCVM V22.7 is Released

There are three ways to access UCVM.

The easiest way to query for material properties of a handful of locations and to visualize data product is to use a map-based UCVM web portal hosted by SCEC. 1D vertical profiles, 2D cross sections, and 2D horizontal slices are supported and can be downloaded to the user’s system along with the data product. The portal is under continuous development, and processing capabilities maybe limited.

Moho.scec.org/UCVM_web/webviewer.php

If users’ local machine is not Linux-based or if full featured UCVM is not required, another way to access UCVM is to use one of the prebuilt UCVM Docker images being hosted on the public accessible Dockerhub. UCVM Docker image is a virtual machine solution and therefore users need to work within limits of the local host computer. There is a detailed step-by-step instruction at the GitHub repository for using UCVM Docker images.

https://github.com/SCECcode/ucvm_docker

Lastly, if users need to build simulation meshes or run on supercomputers with MPI, a native installation of UCVM on a Linux system maybe required. In this latest UCVM release, an improved and robust installation and testing framework has been put in place to minimize the tedious task of building and validating a local UCVM installation. The complete UCVM core code is in a GitHub repository.

https://github.com/SCECcode/ucvm