

CavProfile - Display and interpretation of spiral measurements

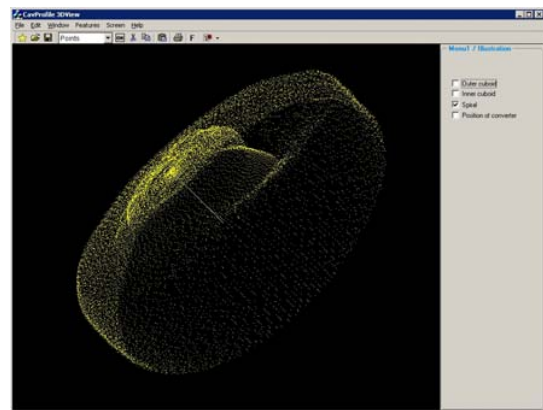
Software development is a long and a very costly path that a company has to take to ensure that it constantly has cutting edge technology.

New generations of tools, modern hardware components and even further development in the field of computer technology have for SOCON always been reason enough to keep the company software constantly up to date. The CavScan software for survey data acquisition as well as CavView II for assessing and interpreting echometric cavern surveys have paved the way for a successful transition from computers with Motorola processors to PCs running the WINDOWS operating system. In the next step the interpretation program CavProfile for spiral surveys is to be converted. Naturally all the possibilities offered by a modern software development environment, such as color graphics, three-dimensional displays and up-to-date menu navigation, will be taken advantage of to the full. Considering the amount of changes being made it is not so much simply a migration of the present program package to a new operating system, but rather a new software development.

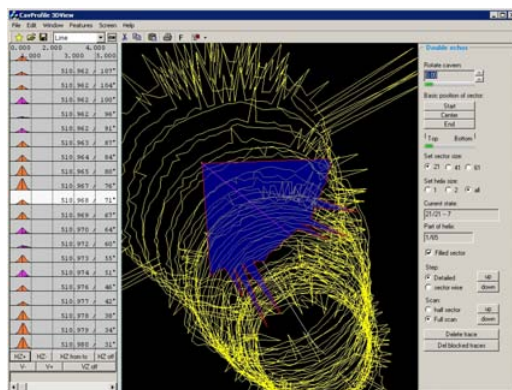
CavProfile – Interpretation in 3D

CavProfile is a 3D software application for processing the data obtained from spiral surveys.

Included in the software to aid the interpreter are the latest 3D technologies, filter functions for finding multiple echoes as well as functions for processing spiral sections and individual echo traces. The current stage of processing can be viewed three dimensionally at any time.



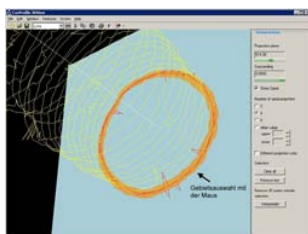
S. Wieber-Klocke



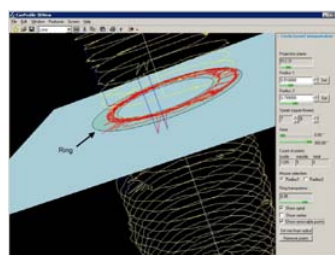
Processing of selected echo traces

Options in spiral interpretation

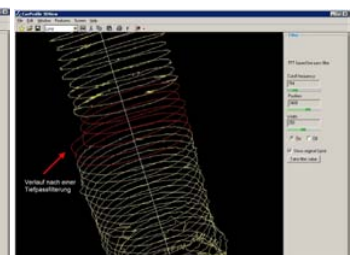
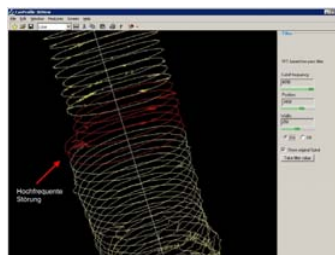
- ⇒ Stacking of several coils
 - Mark an area by mouse click or define two circular areas which enclose the actual echo signals
 - Remove all the echo signals that are located outside of these areas
- ⇒ Processing of selected echo traces
- ⇒ Low-pass filtering to remove high frequency interference



Stack of several coils with area marked by the click of the mouse



Stack of several coils with two circular areas defined



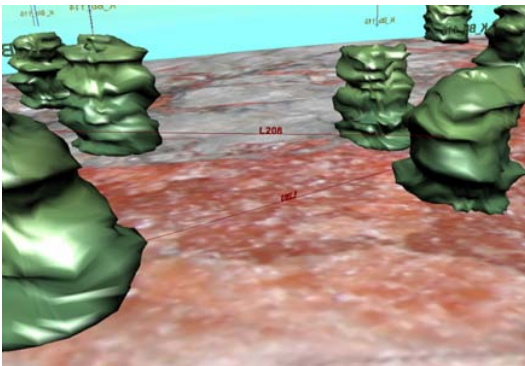
Spiral coil before and after the low-pass filtering

CavWalk Professional - updated version with new functions

It came out 10 years ago – CavWalk, a software package with which the results of echometric cavern surveys can be easily presented and animated three dimensionally. The software was developed in house by SOCON. One of its main characteristics is the simple data transfer from CavView II for separate caverns and from CavMap for entire cavern fields. This allows the user to generate quickly and efficiently 3D models without him having to have any special knowledge of 3D modeling.

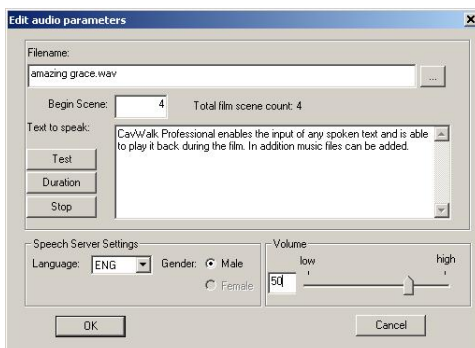
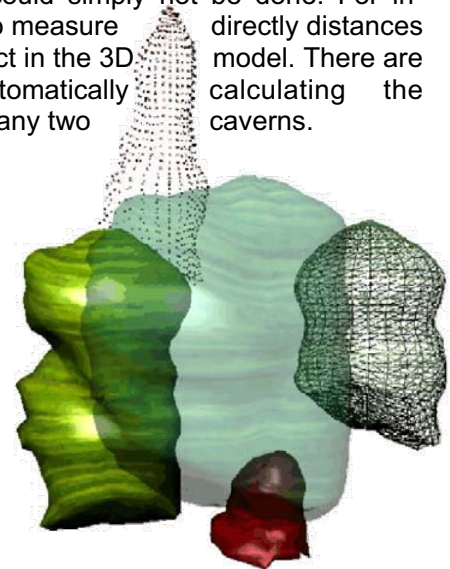
What CavWalk is able to do has been regularly expanded over the past few years and during this time it has been adapted to the special needs of users in the cavern industry. For instance the standard version of CavWalk includes already a broad range of functions for displaying boreholes, casing shoes and various interfaces in the cavern as well as for tying in the surface situation, in the form of topographical maps, and the geological situation .

(The standard version of CavWalk can be downloaded free of charge from the DownloadCenter at www.socon.com.)



At the beginning of 2007 the new CavWalk Professional software was released, and this contains even more functions. Yet CavWalk Professional is not simply another upgrade of the established CavWalk software, instead, thanks to its newly structured 3D model functions, it offers the user various functions that previously could simply not be done. For instance, it is now possible to measure directly distances between any selected object in the 3D model. There are also preset functions for automatically calculating the shortest distance between any two caverns.

There are also improvements in the modeling of 3D objects. Caverns can now be displayed as area models, line models or as scatter diagrams. Furthermore geological interfaces can now be displayed transparently, which makes the three-dimensional views of the models even clearer. The level of transparency can be set to be anywhere between 0% and 100%. Importing and exporting complete 3D models can be done simply using the generally used dxf format .



CavWalk films learn to speak

Besides extra film functions, CavWalk Professional now includes an integrated speech editor (speech server) with which the user can input any spoken text and have it played back during the film at a set scene. Presently there is the option to input speech in English or German, but other languages can be made available on request. Applying these new functions you can add any explanations necessary to films created with CavWalk Professional. In addition, the speech server also gives the option of adding music files, which together with the explanatory spoken word create the right setting for the 3D animation.

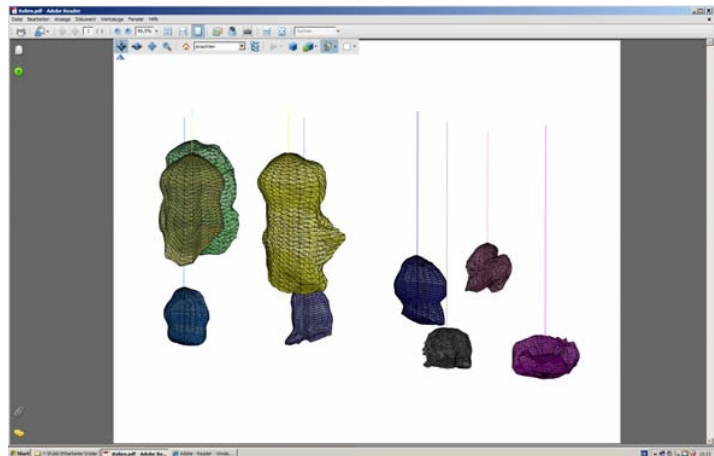
You will find an example of a film created with CavWalk Professional at our website www.socon.com.

SOCON reports with 3D PDF animation

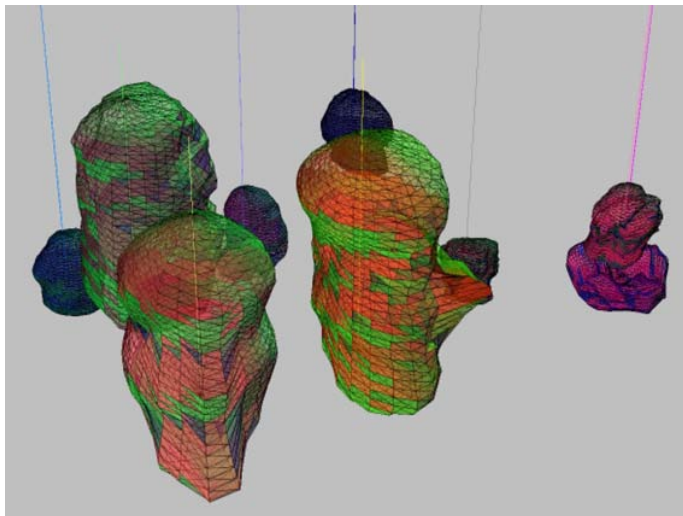
“When the picture learned to move ...“ is the title of a TV series from 1966/67 and came straight to my mind when I saw the new Adobe® 3D PDF Reader. Indeed, it is now actually possible with Adobe® Acrobat® 3D software to generate three-dimensional images as an animation and to publish this as a PDF file.

Lively reports

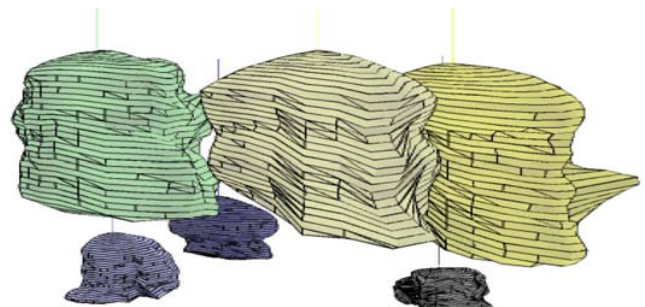
Our customers are used to getting six perspective views of their cavern with every SOCON survey report. These displays can now be replaced by a lively 3D PDF animation in a report. The advantages of this new form of reporting are evident, for instance it enables the customer to decide for himself what view, what perspective, and what extent, total or partial view, is important to him. Furthermore the Adobe® 3D PDF Reader provides a range of functions and display options that are most useful for a quick and simple presentation of survey results. As of now customers can request 3D animations to be included in a SOCON report.



Adobe Reader 8.1 with the 3D menu bar



3D view of a cavern field as
> transparent wireframe graphic,
> lighting in base colors



Shaded display, with cube light

From the sonar survey to a 3D PDF

Once the sonar survey has been carried out by SOCON and the survey data have been interpreted, the final data are exported from our *CavView II* software to *CavWalk Professional* as a DXF file. This DXF file is then converted by Adobe Acrobat 3D to a PDF file. The results of this method are adequate for quickly generating a PDF file for displaying simple moving 3D models.

As an extra service we can prepare the data of entire cavern fields as 3D PDFs. For this we require the coordinates of the caverns (XYZ of the drilling location and the casing shoe) so as to be able to display the cavern field at the correct locations with our *CavMap* software. Then from *CavMap* the data can be exported as a DXF file for conversion to 3D PDFs. By including an intermediate step, namely from *CavMap* to *CavWalk Professional*, it is possible to convert to 3D PDFs also extra graphic objects such as layers and textures.