**dQant7** - Quantitative Analysis Using both Energy and Wavelength Dispersive X-ray Spectrometers

**dQant7**, a Microsoft Windows application, performs quantitative electron probe microanalysis using data from both energy (EDS) and wavelength dispersive x-ray (WDS) spectrometers. **dQant7** is an upgrade from our very successful dQant32 program. **dQant7** controls our dSspec7 system, which automates the wavelength dispersive spectrometers, the stage motors and the WDS counting electronics for your electron probe microanalyzer. New features in dQant7 include:

- Faster serial communications.
- Overlay two WDS spectra with flexible scaling, multiple peak markers and annotations.
- Ability to specify the exact order in which to measure the elements for an analysis.
- Automatic PHA setup or detector bias scan from the element table.
- Entering new elements into the element table automatically selects the optimum crystal, position and PHA settings.
- While viewing analytical results, a “Copy to Excel” button will open Excel and paste the data
- Auto Focus is now faster and more user configurable.

**dQant7** along with **dPict7** (our digital imaging program) provides a truly state-of-the-art replacement system for your aging EPMA automation package. In many cases a replacement system is equivalent to the cost of a few yearly service contracts.

This brochure describes **dQant7** with illustrations from actual screens seen in the course of operating the program. The EDS program, PGT’s PC based Avalon, is controlled from within **dQant7** giving you the capability of combined analyses.

The on-line HELP, along with an analysis wizard, will guide you through your first analysis and also serve as a reference for future questions for the novice and expert alike. Help is available by phone, on-site, by e-mail, or from our web site. Software updates are also on our web site.

Take advantage of Geller MicroÅnalytical Laboratory, certified to ISO-9001 and Accredited to ISO-17025, a company with years of EPMA experience. We are one of the few companies that know the instrumentation, the applications, and how to make it all work together. We also offer analytical services using **dQant7** on our JXA-8600 and training courses on demand- at your site or ours. We will be happy to supply you with demonstration programs for dSspec7, **dQant7**, **dPict7** and Image Pro Plus (for particle size counting). These programs are fully functional (with the exception of data collection or the importing of external data).

**System Requirements for dQant7**

A standard high end PC (we prefer the Dell Optiplex line) with at least 1GB memory, Microsoft Windows XP or Vista and three serial ports. **dQant7** uses a parallel port “key” which is transparent to other connected devices. Depending on the configuration, PCI slots and USB ports will also be required. Please call for details.

**DEMO DISKS AVAILABLE!**

**dQant7** starts at $15K (with customer supplied computer). User installed.
The dQant7 main window shows a menu, a combo box in which to type commands (it also stores all commands for future instant recall), a tool bar for frequently used operations and it contains all other windows.

The Element Table is the heart of dQant7. It stores spectrometer parameters and x-ray intensities from both the standard and the unknowns and provides the control for collecting x-ray intensities. The Standard Table stores stage positions and concentrations of your standards. Commands for getting, setting and refocusing are in the Standard menu or on the buttons in the bottom of the table.

All of the tables are Microsoft Access 2003 database files, which can be imported into many applications or worked on within Access. They can be sorted and queried on any column.

The Output window simulates printer output. Command responses and error messages are written here. The output can be copied to the clipboard, printed, saved or automatically saved to a selected file as the text is written. Files are written in ASCII format.

All program errors are trapped and identified so that the program will never crash. A log file is created that pin-points exactly what the error is and where it occurred within the program.
Standard calibration data can be accumulated into Average files. From there you can select which standardizations are to be included in the average. Averages are then written to the Element Table.

Using standard intensities from the Element Table, Minimum Detectability Limits can be calculated. By varying the counting time and beam current conditions, it is easy to determine what data collection conditions are necessary to achieve the desired detection level.

The WDS Spectrum display provides live viewing during data acquisition for all your spectrometers simultaneously. Functions are available for a cursor, x-ray marker lines, labels and plotting in units of mm, angstroms or keV. There are macro commands, which allow you to collect and save spectra in an unattended mode. Two spectra can be overlaid for comparison.

The Options form is used to view and modify the states of system switches and variables, which are used to tailor operation of the EPMA to specific applications. The settings can also be changed from a macro command and are stored in user configuration files.
The Analysis Wizard provides total control and flexibility of your analyses. Define setup and data files, labels, key switches and analyses modes.

An X-ray Wavelength Database contains wavelengths for all the major x-ray lines and displays spectrometer positions for x-ray lines up to 7th order. It can be used to determine crystal positions for specific elements. Possible peak overlaps can be verified by noting multiple order reflections present at a particular crystal position. The data can be sorted in any way or easily searched. Being a Microsoft Access 2003 database file, the data can be easily modified or supplemented. How about showing a graph with the peaks identified (truncate the λ database)? I think it would be a good idea to have a comparison sheet with dQant32 showing the differences.

dQant7 commands can be assigned to 48 function keys for immediate operation of frequently used commands or macros. Macros are dQant7 command programs providing powerful flexibility and control of automated functions.

The Quant Setup form makes it easy to create and edit setup files, which define the quantitative analysis. Since correction factors of the standards can be quickly calculated for each analysis, the standard compositions and all elements in the unknown as well as the standards must be included. dQant7 will search the elements in the standards and automatically include them in the list along with oxygen if oxide formulas are entered.