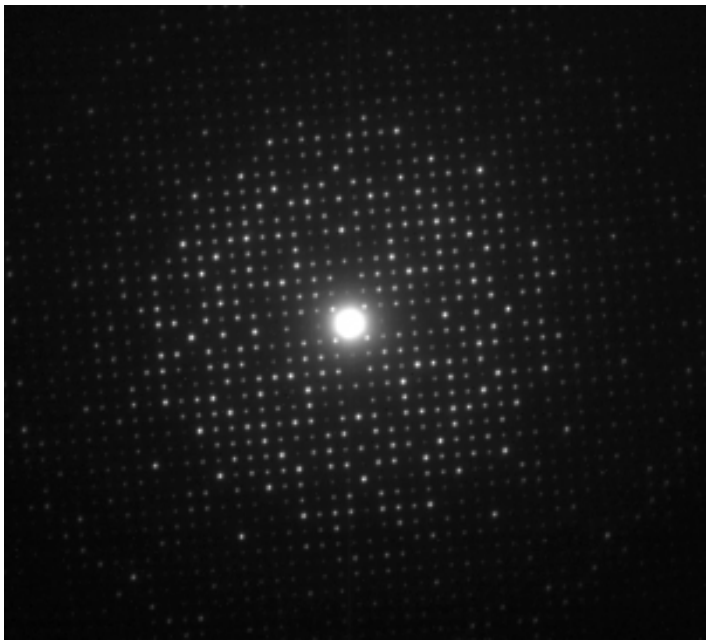
# DIFPACK Module

## Model 700.50

The diffraction analysis package (DIFPACK) is a group of tools and menu items designed to automate the analysis of diffraction patterns and diffractograms. DIFPACK provides simple and accurate measurements of spacings and angles between spots. It automatically keeps track of all measurements in different images and provides output that can be easily exported to any word processor or plotting application.

DIFPACK allows the automatic measurement of:

- D-spacing
- Diffraction spot (reciprocal) distance
- Angle to reference spot
- Angle to x-axis
- The brightest pixel amplitude for any spot in a diffraction pattern or diffractogram



### Benefits

- **Automatic management of measurements:** The results are displayed in text format in the Results window for simple exchange with other applications. All results are also scored with the image file for automatic bookkeeping and retrieval of previous measurements. Individual measurements can be hidden, shown, deleted or listed.
- **Improved diffractogram:** The calculation of the diffractogram of a lattice image is preceded by masking in real-space to eliminate streaking and improve measurement accuracy. Automatic tracking between lattice image regions and diffractograms allows direct visual feedback of the region being analyzed.
- **Accurate peak location:** Automatic peak search and refinement to sub-pixel accuracy through the use of center of mass calculation (for diffraction patterns) and interpolation (for diffractograms) to provide maximum accuracy. Flexible control of peak search region allows detection of close spots.
- **Optimized calibration:** Using the peak location feature the program provides accurate magnification calibration directly in reciprocal space. Diffractograms can be calibrated directly in reciprocal space or from the lattice image. Calibrations are automatically transferred between real and reciprocal space.

  The scale and units of a reference image can also be transferred to other images.

- **Center location:** The center of diffraction patterns can be automatically located using a cross-correlation technique (for centrosymmetrical patterns) or be determined manually from a pair of spots located symmetrically about the central spot. The peak location procedure is invoked to ensure high accuracy. The centers derived from different pairs of spots can be averaged to improve accuracy. Direct manual identification of center location is available for patterns with no symmetrical spots.
- **Background thresholding:** Background noise can be automatically distinguished from dim spots through the use of an empirically determined threshold parameter.
- **Flexible data types:** Operates on integer 1, 2 and 4 bytes, real 4 and 8 bytes, complex 8 and 16 bytes, packed complex (after automatic conversion to complex 8) and RGB (after manual extraction of amplitude channel).

### Applications

- Life science
- Material science
- Natural resources
- Electronics

## Requirements

| Computer | Configuration |
|---|---|
| Hardware | Standard computer configuration for DigitalMicrograph® system. |

Specifications are subject to change.

## Ordering

| Model | Description |
|---|---|
| 700.LS.700.50.64.1 | DIFPACK Suite (64-bit) |
| 700.LS.700.50U2.64.1 | DIFPACK Upgrade to GMS 2 (64-bit) |
| 700.LS.700.51.64.1 | DIFPACK Software (Offline, 64-bit) |
| 700.LS.700.51U2.64.1 | DIFPACK Upgrade to GMS 2 (Offline, 64-bit) |
| 700.LS.700.51U3.64.1 | DIFPACK Upgrade to GMS 3 (64-bit) |





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