Laser diffraction: Super short guide!

PROCEDURES for measuring and saving data

Preparatory work

- Depends on sample and available time: Sample volume, , expected particle size, expected sorting, sample matrix, purpose, organic content, carbonates, etc.

Start up, HELOS

- Logon (username *Labguest* and corresponding password)
- Key: Position 2 (online)
- Module (Quixel with 2 or 6 mm flowcell, or Gradis). Note: Switch key to position 1 when changing module.
- The Quixel panel: Drain and fill x2 to rinse the system, repeat 3 times

Signal test

- **Auto, Online** and perform **Initial reference measurement**

Setup configuration

- Product (Quixel: *Sedimentation fraction*, or Gradis: *Quartz*)
- Lens (R1, R4, or R7)
- Trigger condition (Quixel: *Quixel test 01*, or Gradis: *Gradis test 9*)
- Disperser (Quixel: *Quixel test 06*, or Gradis: *Feed rate 50*)
- Template (*R1-SQS-Common*, *R4-FRS-Common*, or *R7-FRS-Common*)
- Forced stability, FS: When using R7 set FS to 1

Measuring procedure
Repeat this section for every sample

- Perform a **standard reference measurement** on the solvent (air or sodium pyrophosphate) before each sample addition
- Type relevant **sample info** (ID, fraction, project etc.), + "0"
- Add **material:** Ensure an optical concentration of 15-30% (or 5-50%)
- **Measure** the sample 3 times, choose **valid measurement** to work with
- **Save** raw data (save diagram and report as pdf files)
- **Clean:** Quixel: Drain and fill x2, repeat 3 times. Gradis: Use brush and/or vacuum cleaner and pressurized air

Shut down

- If left over night: Keep flow-cell in, filled with dem. water. For longer standby: Flow-cell must be removed and stored with dem. water
- Key: Position 1 (standby)

Data retrieval, Q(x)

- *PSD/Import/Windox database:* **Select measurements** (1 per fraction)
- **Rename** all objects to corresponding sample name, fraction etc.

Merging procedure
Applies when having several fractions

- *Object information:* Use hack "/00" in date field to make changes: Select "mass" and enter **gram**
- Highlight objects for 1 sample and **merge** using *Statistics/merge*
- **Check** data set before proceeding: Select all new objects, go to *View/Diagram*

Output

- Each final object may need to have its **table changed** (go to *Particle size* and select appropriate sequence: R4+R7, clay-silt-sand, sortable silt or other). For a merged object you may have to select *Geometrical* data as **classification**
- Select all final objects, go to *View/Display table* and choose relevant columns for the output table (**Q3(x), fraction p3** and frequency q3*)
- Choose **percentage** and either particle size interval or **single point**

Save

- *File/export all:* Save 1 or more data tables with the selected output as .prt
- *File/save:* Save the **project file** as .sqx
- *Import* to Excel or other spreadsheet and adjust data for presentation. Optional: Construct ternary plot using the clay-silt-sand dataset (ask for file-template)