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Sub-populations

INTRODUCTION

The Lumetics LINK^{TM} software platform scans network locations for new measurement data files, copies data directly to a centralized database, and provides a powerful user interface for rapid multi-measurement multi-technique data aggregation, visualization, analysis, and reporting. LINK employs a client/server-based architecture where the LINK server hardware is provided by the end user and resides on the end user's network. The LINK client is a portable web-based application that may be placed on any computer with network connectivity to the LINK server. For successful import, the LINK webserver requires read access to the folders where user data resides.

For some Particle Analysis techniques/instruments, LINK will allow calculation and reporting of particle sub-populations, based on particle characteristics that have been defined as part of the Import Method.

In addition to the total particle population data set, sub-populations based morphological parameter filters or buoyancy may be generated at the point of measurement import. An unlimited number of sub-populations may be specified for each measurement. The sub-populations do not count towards the measurement limit per project. Additional Sub-Populations will affect import speeds.

DETAILS

Sub-population based on Morphological Parameters

For each sub-population, the particle count/concentration vs. morphological parameter will be available, as well as representative particle thumbnail images (if applicable).
When creating as sub-population follow these instructions:
- Select a Morphological Parameter from the pre-defined list
- Specify the filter criteria
- Select the + to add the filter term to the Live Expression View
  - The Live Expression View can be edited directly
  - Brackets, mathematical operators/values, logical ANDs or ORs are valid operators
  - Syntax must be exact, for successful application.

Instruments compatible with sub-populations for morphological parameters are: FlowCAM, HORIZON, Hound, MFI, Morphologi G3 and xSight.

Sub-Populations based on Buoyancy

The Archimedes instrument permits a maximum of two material/density values to be defined in the measurement file. New values can be defined in LINK and applied to the measurements during import. LINK will re-calculate particle size based on these new values. This feature can harmonize inconsistencies with material names for different measurements (e.g."Protein", protein", prot", etc) or to modify the density assumption from the original experiment.

LINK can create particle size distribution for multiple additional sub-populations based on different materials/densities. For example, creating three materials called "Protein1, Protein2, Protein3" with densities "1.2, 1.25, 1.3" will show the effect of these densities on the corresponding particle size distributions.

APPLICATION

Database Management

The Sub-Population button in the LINKdb management panel provides the option to view, edit name and delete sub-populations.

Filter Panel Options

The Filter Panel is utilized to isolate measurements in the project for inclusion in the dashboard's analyses (charts, tables, and images). It is also used to Split the pool of project measurements into separate series, which are then reflected within the chart, chart series stats table, and thumbnail Image calculations/display. This is where the measurements can be split by sub-population created for the import method.

Measurement Summary Table

The measurement summary table is a flexible tabular summary that will display any LINKdb Field (Instrument or User-defined) for all the measurements isolated in the dashboard's filter panel. Measurement summary table templates contain their own **Split** (measurement grouping) criteria that operate independently of a dashboard's Filter Panel. This feature is used determine how the measurements isolated by a dashboard's filter panel should be grouped, including sub-population.

Computed (Raw Data) LINKdb Fields

Specification of Sub-Population can be used in the calculation for Raw Data LINKdb Fields for applicable analytical techniques.

Create/Edit LINKdb Fields based on Raw Data Calculation

Field Name	Instrument	Sub-Population
sample	MFI 4200/5200	Total Population

Calculation Type	Parameter
SUM	Particle Concentration (#/ml)

for

Parameter	Range
Particle Diameter (μm)	

E.g. ">=2", "2-10", or ">=2 AND <= 25"

Cancel   Save

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EXAMPLE

Included below are sample dashboards from measurement files exemplifying sub-populations

1. Stacked column chart plotting raw data from MFI based on sub-populations and particle concentration ranges

Column Chart Subpopulation Example

Legend:
- ■ MFI 4200/5200, Protein, 2 - 10 μm
- ■ MFI 4200/5200, Protein, ≤ 2 μm
- ■ MFI 4200/5200, Protein, ≥ 25 μm
- ■ MFI 4200/5200, Silicon Oil, 2 - 10 μm
- ■ MFI 4200/5200, Silicon Oil, ≤ 2 μm
- ■ MFI 4200/5200, Silicon Oil, ≥ 25 μm
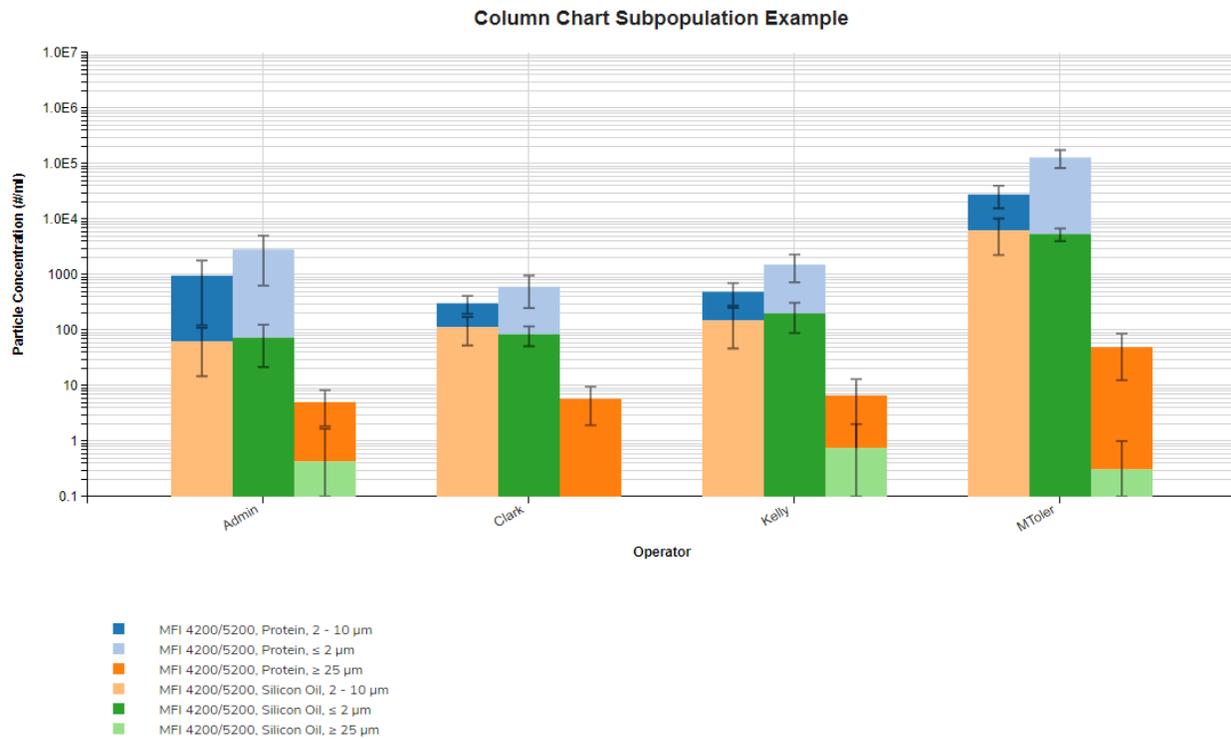
2. Histogram plotting raw binned data from MFI and split by sub-populations for Intensity Mean vs. Particle Count

Bimodal Morphology Parameters
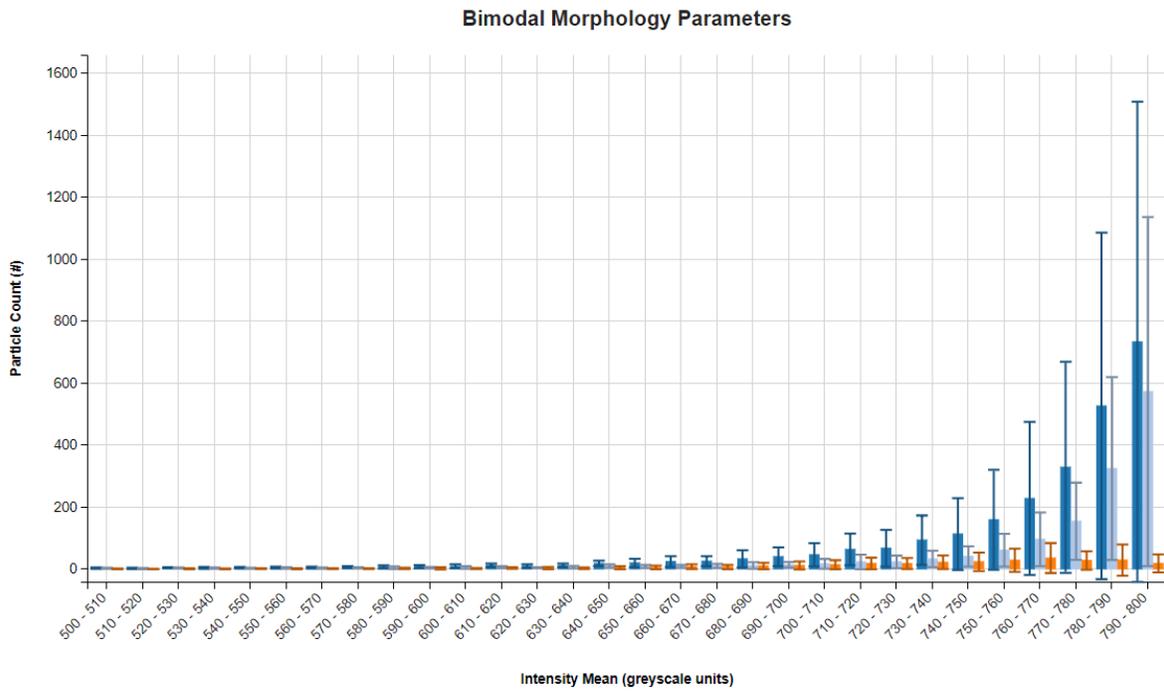
3. Histogram plotting binned raw data from Archimedes for Particle Concentration vs. Diameter and split by sub-population

Density PSD Comparisons
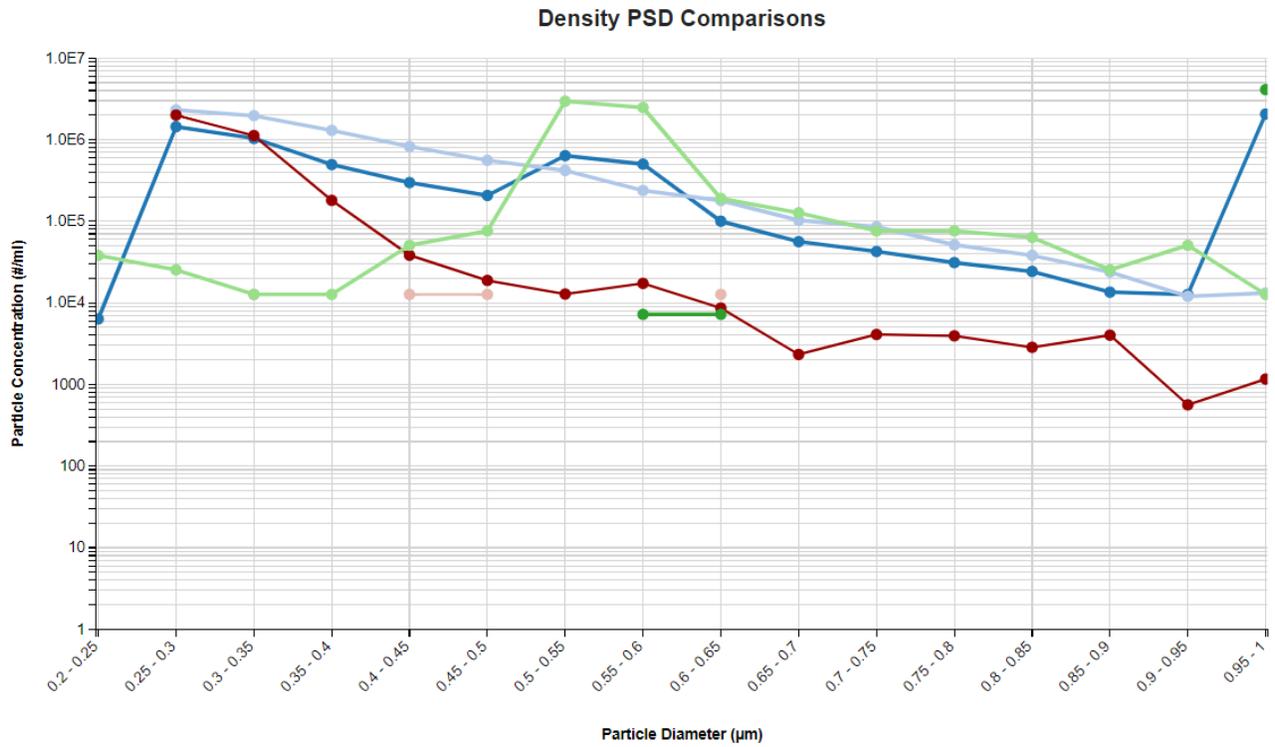
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