

Spatially Advanced Measurement by Spectroscopy for liquid applications

Example of parameters that can be predicted:

- Mean particle or droplet size and density
- Nanolipid encapsulation
- Adsorption of molecule or cell on solid particle
- Polymer fraction
- Gel point (crystallization)
- Modification of particle shape
- Chemical concentration





SAM-Spec®

For the biotechnological and pharmaceutical industries, **Indatech - Chauvin Arnoux Group** proposes several innovative spectroscopic analyzers for assessing the critical physical and chemical quality criteria of your product in-line in real time.

From upstream to downstream and not forgetting lyophilization, our experts will offer you the best cost/performance ratio while taking your goals into account: speeding up development of the process or improving and automating production.

Our solutions are fully compatible with automation thanks to their OPC UA communication capabilities and have already been integrated in the systems of major players such as GEA, Pharmatechnology and Proditex.

Spatially Advanced Measurement by Spectroscopy (SAM-SPEC) is a new probe technology able to provide both physical and chemical information related to your complex liquid directly in the process in real time.

With this advanced technology, combined with our UV-Vis (Asuryan) or NIR (Hy-Ternity) spectrometer, several processes can be improved such as cell culture, emulsion synthesis, crystallization, polymerization, filtration, purification...

Improving sampling



Chemical & physical information



Higher level of understanding

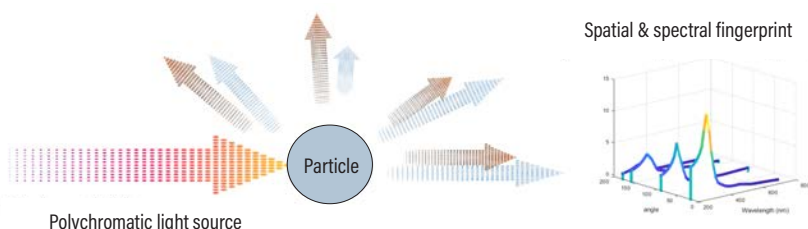
How it works

The technology uses light scattering and absorption based on several acquisitions at different locations in order to obtain different types of information.

Unlike standard approaches such as granulometers or turbidimeters, several wavelengths are used to illuminate the media.

Scattering is generated at different wavelengths. Scattering will be different according to the particle diameter, shape, absorption, and ratio between particle size/ emission wavelength.

For this reason, the spatio-spectral data will contain a maximum of both physical and chemical information.



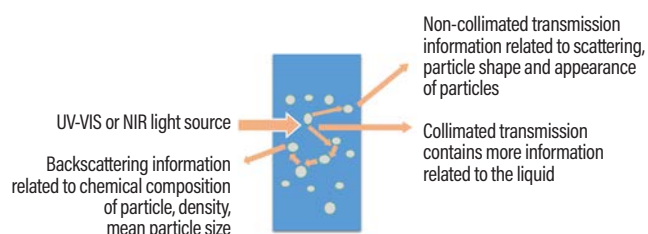
Short wavelengths (blue) will be scattered differently than long wavelengths (red) because the relative size of the particle and wavelength is different.

The 2 D data will provide both physical and chemical information.



Indatech has developed two different types of approaches in order to analyze complex media depending on the situation:

Low to medium turbidity



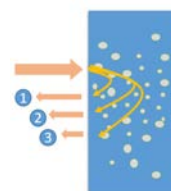
Very turbid media (milky)

UV-VIS or NIR light source

Spatially resolved backscattering

First position provides mainly particle information

Third position provides deeper information on the liquid



Available probe designs

Multiangle probe SFX



Multiangle Flow cell SFX-F



Multipoint SPC



Number of channels	3	3	12 + 1
Wavelength range	230 - 1700 nm	230 - 1700 nm	400 - 1700 nm

Compatibility with Indatech spectrometers

ASURYAN (UV VIS) and **Hyternity (NIR)** spectrometers are designed to work with **SAM-SPEC®** probe technology since they are both real-time multichannel instruments (without multiplexing). Indatech's **READY** software is specially designed to handle these specific types of probes.

Each channel is recorded depending on the probe design. The data can be generated in different formats such as unfolded data or matrix data. The reference measurements for our probe are also performed using our specific approach, in compliance with the USP standard.

General advice

MEDIA	PROBE	SPECTROMETER	SOFTWARE
Clear / Opaque	SFX	Asuryan (UV-VIS)	ASR Ready
Turbid small particle < 500 nm	SFX	Asuryan (UV-VIS)	ASR Ready
Turbid large particle 1 µm to several µm	SFX	Hyternity (NIR)	SRS Ready
Milky 200 nm to several µm	SPC	Hyternity (NIR)	SRS Ready

Example of applications

	PROBE	SPECTROMETER
Polymerization	SFX	Hyternity (NIR)
Emulsion monitoring (oil droplet size 200 nm to 5 µm)	SPC	Hyternity (NIR)
Protein aggregation	SFX-F	Asuryan (UV-VIS)
TiO ₂ nanoparticles in suspension	SPX	Asuryan (UV-VIS)

ASURYAN

UV-VIS SPECTROSCOPY



HYTERNITY

NIR MULTIPOINT SPECTROSCOPY

