See what single-angle DLS misses.

MAPS gives you three perspectives and a clearer picture of every population.

Imagine you're at a concert trying to identify everyone in the crowd. Standing in one spot, some people are blocked, others blur together. You move around — to the side, further back, from a different angle — and suddenly you see what you missed. MAPS works the same way: three angles, one complete picture.

What is MAPS

Multi-Angle Particle Sizing (MAPS) is an advanced Dynamic Light Scattering (DLS) method that measures particle size at three angles simultaneously — 175°, 90°, and 15°. Each angle captures different information about the particle populations in your sample. The signals are then combined by an algorithm into a single, high-resolution size distribution.

Why Multiple Angles Matter

In a standard single-angle DLS measurement, particle populations that are close in size tend to overlap and blur into a single broad peak. MAPS overcomes this fundamental limitation:

- **Standard DLS**: can separate populations only when sizes differ by roughly 3:1
- **MAPS**: resolves populations with a size difference as small as 2:1 — detecting species that single-angle measurements would merge into noise

This sharper resolution matters most in complex real-world samples: pharmaceutical formulations, cosmetic emulsions, nanoparticle dispersions, and any system where knowing the exact number and size of populations is critical for quality or stability.

Why does the detection angle matters?

Particles of different sizes scatter light with different intensities depending on the angle. Depending on the measurement angle (175°, 90° or 15°), large particles may dominate or small particles become more visible. MAPS captures all three simultaneously — so no population is lost because it scattered weakly at the single angle being measured.

What does “resolution” mean in practice?

Resolution is the ability to distinguish two particle populations that are close in size. Standard DLS tends to blend them into one broad peak. MAPS separates them — revealing whether your formulation contains one population or two, and whether that ratio changes over time. For quality control and stability testing, this difference is decisive.

Where MAPS Makes a Difference

Pharmaceutical formulations

Liposomes, nanoparticles, and drug delivery systems often contain multiple size populations. MAPS detects each one independently — critical for efficacy, safety, and regulatory compliance.

Cosmetics & personal care

Emulsions and gels such as hyaluronic acid formulations can degrade or aggregate over time. MAPS identifies population shifts early, supporting stability testing and quality control.

Nanomaterials & colloids

Complex dispersions with closely sized components are difficult to resolve by standard DLS. MAPS separates populations at a 2:1 size ratio, giving a reliable view of the full distribution.

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Real-World Performance: MAPS in Action

Two liposomal dietary supplements — complex, multi-population samples representative of pharmaceutical and nutraceutical formulations — were measured on both the Litesizer DLS and a competing multi-angle DLS instrument. Both instruments applied the same multi-angle measurement principle. The results show a clear difference in resolution quality and repeatability.

Anton Paar Litesizer DLS (MAPS)			
Sample	**Peak 1 (nm) ± RSD %**	**Peak 2 (nm) ± RSD %**	**Peak 3 (nm) ± RSD %**
Sample 1	219.7 (± 0.53 %)	783.2 (± 2.96 %)	2699 (± 2.94 %)
Sample 2	210.4 (± 3.79 %)	473.7 (± 3.39 %)	2829 (± 2.65 %)

Competing multi-angle DLS instrument			
Sample	**Peak 1 (nm) ± RSD %**	**Peak 2 (nm) ± RSD %**	**Peak 3 (nm) ± RSD %**
Sample 1	155.2 (± 5.72 %)	423.5 (± 14.21 %)	4134 (± n.a.)*
Sample 2	135.9 (± 3.35 %)	445.4 (± 2.75 %)	2960 (± 34.35 %)

** Peak 3 is resolved in only one of three consecutive measurements on the competing instrument; RSD was therefore not calculated.*

Three peaks resolved. RSDs below 4%. Every measurement.

The competing instrument returned RSDs up to 34% on the same peaks — and failed to resolve Peak 3 consistently in one sample.

Key Applications at a Glance

Particle mixtures

Resolve overlapping populations in multi-component dispersions that appear as a single broad peak in standard DLS.

Stability & degradation

Detect the emergence of new size populations over time — an early indicator of aggregation, degradation, or formulation change.

Quality control

Confirm batch-to-batch consistency with higher resolution and repeatability. MAPS gives you confidence that the size distribution is truly uniform.

Learn more

https://www.anton-paar.com/corp-en/products/details/litesizer/

https://www.anton-paar.com/corp-en/services-support/document-finder/application-reports/an-insight-into-multi-angle-particle-sizing-maps/