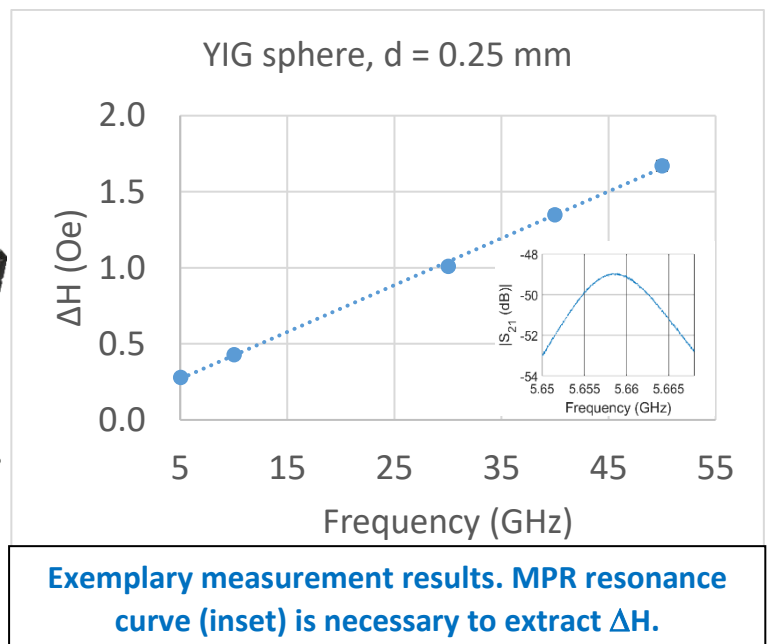


MICROWAVE CHARACTERIZATION OF FERRITES

MPR SUBWAVELENGTH CAVITY



We offer the most accurate and highly repeatable resonant fixture dedicated to the characterization of the room temperature intrinsic **ferromagnetic linewidth (ΔH)** of low- and moderate-magnetic-loss ferrite **spheres**. The presented fixture consists of a sub-wavelength **cylindrical cavity** and a **hand-held tunable magnet**. The device is equipped with specialized **software** based on a **novel electrodynamic model** extracting ΔH of the material under test from the **frequency** and **Q -factor** of the magnetic-plasmon-resonance (MPR) of the sphere measured for a given vertical position of the magnet knob.



The hand-held tunable magnet allows performing the measurement in the **5 – 9 GHz** frequency range although it can be extended to the maximum range of **2 – 18 GHz** by changing the spacer sleeves and the cavity support. The subwavelength cavity acts as a mechanical holder so it can be used up to the resonance frequency of its fundamental mode at ca. **60 GHz**. However, any use beyond 18 GHz requires the use of a stronger magnetic bias, e.g. with an external magnet.

The whole measurement setup consists of a computer, where the software is installed, connected to a vector network analyzer (such as PNA-X N5245A, Keysight) or a Q-meter. The setup operates at the resonant mode of the sample, enabling a continuous broadband measurement of samples meeting the following requirements:

1. **Ferromagnetic linewidth limits:** $\Delta H < 0.25$ Oe @ 2 GHz, $\Delta H < 5$ Oe @ 5 GHz, $\Delta H < 30$ Oe @ 18 GHz
2. **Sample diameter:** $D < 0.6$ mm

Customizations are possible for all specifications provided in this leaflet, e.g. bigger magnets can be applied.