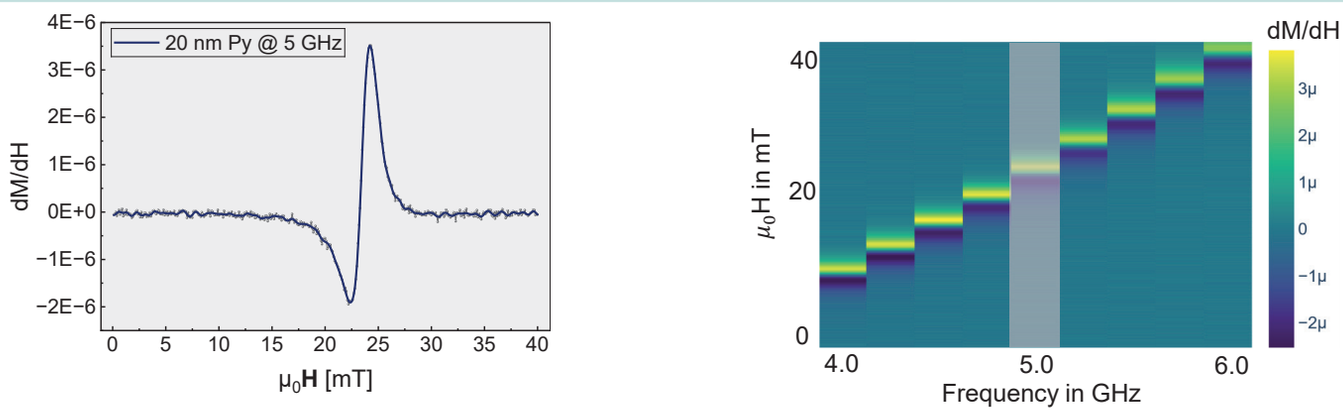
CRYOGENIC

CRI²SPIN Scientific Instruments

Ferromagnetic Resonance (FMR) & Inverse Spin Hall Effect (ISHE) Insert

The Ferromagnetic Resonance (FMR) probe is designed to accept a Coplanar Waveguide that allows the measurement of in-plane and out-of-plane ferromagnetic resonance spectroscopy using the same insert. The unit is supplied with Cryogenic semi-rigid coaxial cable assemblies, associated RF connectors and an easy and repetitive sample mounting fixture.



Frequency Sweep at Room Temperature, showing result at 5 GHz as an example

Key Features:

» **Dual FMR Probes:**
Two insert FMR probes with co-planar waveguides (CPW) for in-plane and out-of-plain FMR and in-plane ISHE measurements

» **ISHE-Ready:**
DC lines for ISHE measurements, with precision alignment stage

» **Modulation Coils:**
Surround the CPW and sample platform, enabling standard FMR with magnetic field modulation and Schottky diode detection

» **Broadband Capability:**
Perform broadband measurements with a vector network analyser (VNA)

» **Dedicated Software:**
To perform frequency dependent FMR measurement series (i.e. resonance field vs. frequency and field line width vs. frequency).

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Scientific CRI²SPIN Instruments

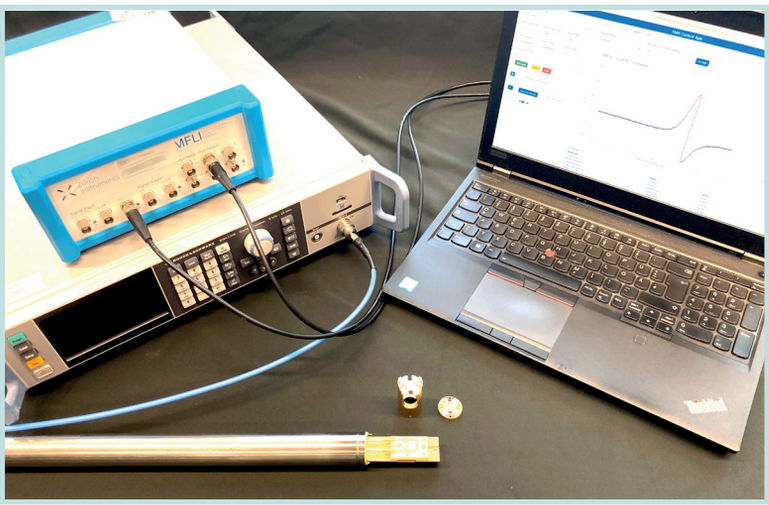
Unlock precision and versatility in spintronics research

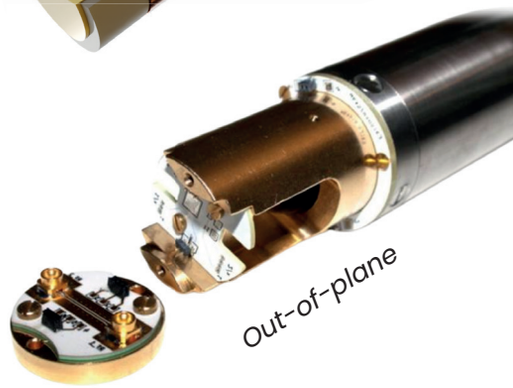
Precision Sample Alignment for ISHE

- Direct electrical contacting of the sample for inverse spin Hall effect (ISHE) measurements through a specialised alignment stage;
- Enables accurate sample alignment relative to the external magnetic field;
- An optical microscope combined with a linear translation stage ensures precise positioning of the device under test (DUT);
- Achieve angular precision better than 1° between the DUT and CPW.

Perfomance:

Bandwidth	Up to 40 GHz
Microwave Signal Generator	To meet research requirements
Lock-in Amplifier	MFLI or similar (optional upgrade to VNA)
Magnetic Field	Up to ±16 Tesla
Temperature Range	4 - 300 K
Magnetic Parameters	• Field linewidth • Damping constant • Sample saturation magnetization • Anisotropy constant
Sample Size	Up to 10 mm^2
DC Lines for ISHE Measurements	2+4





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