

DEAR COLLEAGUE:

We are looking forward to seeing some of you soon at the ENC and telling you about the exciting advances we have made in the last year. These include: (A) the most significant advance in THz waveguides in half a century (to enable MAS-DNP in narrow-bore magnets); (B) a dramatic advance in performance of UHF H/F/X/Y MAS probes (up to 1200 MHz!); and (C) a novel method that yields a dramatic increase in S/N on broad resonances. We are presenting posters on these, and there's much more coming that you'll want to hear about. See you in Asilomar – or perhaps later, at ISMRM, Alpine solids NMR, or SMASH.

David and Judy Doty

[Positions Available](#)

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The Amazing UHF MAS H/F/X/Y Probe

Preview of ENC Posters

- *The LLWG: A Low-loss, Low-cost, Small-diameter THz Waveguide for MAS-DNP in NB Magnets*
- *Spin Echoes, Adiabatic Pulses, and Fantastic Sensitivity*

Upcoming Conferences

The Amazing UHF MAS H/F/X/Y Probe – up to 1200 MHz



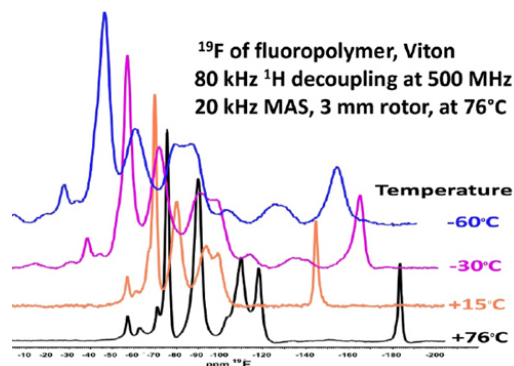
The XVT UHF Quad-MAS H/F/X/Y

- Dedicated ^{19}F and ^1H channels for simultaneous operation of ^1H and ^{19}F
- ^1H and ^{19}F high-power decoupling with amazing isolation, efficiency, stability, and VT range
- 2 Broadband channels, X/Y
- Extended VT range: -180 to +150 °C

ULT UHF HFX Y DNP is coming

(Also H/F or H/F/X Probes)

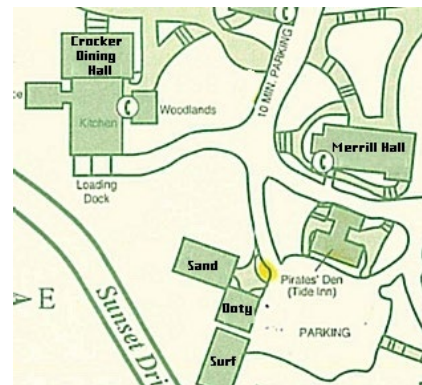
Spectra from an earlier Doty H/F/X/Y probe at 500 MHz



Doty ENC Suite: Surf and Sand

(Ice Cream)

Open 7:00 to 11:00 each evening - Sunday through Wednesday



Preview of Posters to be presented at the ENC

The LLWG: A Low-loss, Low-cost, Small-diameter THz Waveguide for MAS-DNP in NB Magnets

- The most significant advance in waveguides for the 70-1500 GHz range in half a century.
- Achieves loss more than two orders of magnitude below that of fundamental-mode waveguides at 400 GHz.
- Loss comparable to that of corrugated waveguides of similar size but much more manufacturable at small diameters.
- The LLWG shows low loss over an even wider bandwidth than the corrugated waveguide.

The novel Laminate-Lined Waveguide (LLWG) is being integrated into a NB MAS probe for DNP that includes a high-mode THz cavity compatible with MAS and is expected to permit routine low-cost operation below 15 K. The goal is to enable MAS-DNP in NB high-field magnets using solid-state sources. We look forward to discussing more details at the poster session.

For several years we have been working toward enabling high-field ULT MAS-DNP in NB magnets at low cost using solid-state sources. We are making major progress toward that. Come by the Doty suite and we'll tell you more.

Spin Echoes, Adiabatic Pulses, and Fantastic Sensitivity

Getting high S/N from low-gamma nuclides with broad resonances has been a major challenge – and here we are talking about resonances much too broad for MAS to be of any value. In this poster we present the first step toward cracking this challenge – a novel pulse sequence that excites amazing bandwidth, even with large samples at ultra high fields.

- The novel Ellis method applies adiabatic WURST Pulses to the Maricq-Waugh spin-echo sequence to achieve high S/N on such things as ^{25}Mg and ^{119}Sn , where bandwidths may be > 200 kHz.
- The improved spin echo method provides a major increase in S/N over the standard method for broad resonances.
- All the needed NMR parameters are easily extracted using standard methods.
- Static (wideline) NMR Probes for UHF with DNP, and with routine low-cost operation down to 8 K for the ultimate in S/N, are coming soon.

We look forward to discussing more details and results at the poster session (or in the Doty suite).

UPCOMING CONFERENCES

64th ENC

April 16 - April 20, 2023

Asilomar, California – Doty Suite Surf and Sand
<https://www.enc-conference.org/Conference-2023>

ISMRRM

June 03 - June 08, 2023

Toronto, Canada – Doty Booth B13
<https://www.ismrm.org/23m/>

UPCOMING CONFERENCES

Alpine Conf on Magnetic Resonance in Solids

Sept. 10 – Sept. 14, 2023

Chamonix, France

<https://alpine-conference.org/>

SMASH

Sept. 17 – Sept. 20, 2023

Baveno, Italy

<https://smashnmr.org/>