

## HfV2 PULSED ULTRASOUND

Dwight Rickel (NHMFL,LANL) and Jason Lashley (NHMFL,LANL)

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### Introduction

An pulsed ultrasound probe system was constructed for use in the 15 mm bore pulsed magnets. A small sample of HfV2 was used to examine the performance of the system.

### Experimental

We had previously performed a cool down on HfV2 measuring the sound speed velocity as a function of temperature and had identified the transition to the superconducting state at approximately 8 K. We wished to examine the change in the critical field as a function of magnetic field at set temperatures.

### Results and Discussion

The set up was made in cell 2 with the 50T mid-pulse magnet. The pulsed echo system was set up for 20,000 rf pulses/sec with a pulse width of 500 nanoseconds. With these parameters we were able to record 40 milliseconds of data. Sufficient to record data over the whole field range of the magnet, The limitation on the amount of data recorded is determined by the memory size of the TDS5104 data acquisition scope. The present memory available for a single shot is 8Msamples. Although we successfully obtained data for the sample at 4K, seeing the critical field behavior was prevented due to a temperature rise of the sample during the magnetic field pulse. It was not obvious if this was direct sample heating or a problem with the cryostat system, which was leaking at the time of the experiment.

### Conclusions

The experiment bears repeating to see if the heating continues to be a problem. At the time of the experiment the sample was in vacuum and radiation cooled. The introduction of exchange gas and the mounting of the sample on a thermal sink may stabilize the temperature. If sample heating turns out to be an issue then metallic systems may need to be measured on the long pulse magnet.