

Development of microwave resonance at ISIS

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We have designed a microwave cavity suitable for muon spin resonance in the frequency range 2–4 GHz. The cavity is based on a stripline resonator in an enclosing box, with a thin foil window to admit muons, and fits in a standard exchange-gas cryostat. A solid sample is positioned perpendicular to the beam, with the B_1 field in the plane of the sample. The cavity has a fixed frequency once assembled but the resonances are broad enough to allow swept frequency measurements on narrow lines. A demonstration experiment measuring muonium in quartz (Fig.1) is used to show its performance, and other possible uses and design improvements are given.

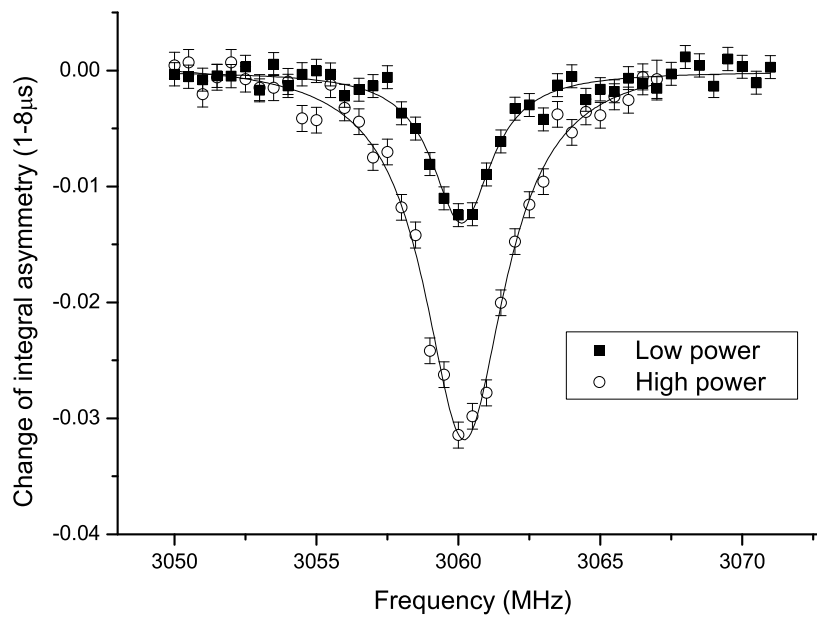


Fig. 1: Example resonances at a fixed field of 1880 G, swept frequency and two power levels differing by a factor 2 in B_1