



	<b>Experiment title:</b> Measuring phonon dispersion and the superconducting gap in the new superconductor MgB <sub>2</sub>	<b>Experiment number:</b> HS 1785
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### Report:

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### Abstract:

We measure phonon dispersion and linewidth in a single crystal of MgB<sub>2</sub> along the  $\Gamma$ -A,  $\Gamma$ -M and A-L directions using inelastic X-Ray scattering. We use Density Functional Theory to compute the effect of both electron-phonon coupling and anharmonicity on the linewidth, obtaining excellent agreement with experiment. Anomalous broadening of the E<sub>2g</sub> phonon mode is found all along  $\Gamma$ -A. The dominant contribution to the linewidth is always electron-phonon coupling.