Spin waves in the B-phase of superfluid ^{3}He in (confined) cylindrical geometry

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We describe experiments on superfluid ^{3}He in a cylinder of 1 mm in diameter. This geometry causes the preferred orientation of the $\hat{\mathbf{n}}$-vector in the superfluid B-phase to be locally different, resulting in a curved configuration across the sample. Exclusive to our experiment is the observation that we succeeded in obtaining a texture which is meta-stable and unchanged in our pressure and temperature ranges, most likely because the experiment is performed at low pressures and low magnetic fields. As this texture can be considered as a potential for spin waves, we had the unique opportunity to study spin waves for several pressures in exactly the same texture. Our geometry causes this texture potential to be nearly quadratic, allowing an analytic solution of the theory which can be compared to our experimental results. As predicted we find the intensities of all spin wave modes more or less equal. Increasing the pressure shows a gradual increase in the number of spin wave modes in our cell.

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