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From incommensurate correlations to mesoscopic spin resonance in YbRh2Si2¹

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Spin fluctuations are reported near the magnetic field driven quantum critical point in YbRh2Si2 [1]. On cooling, ferromagnetic fluctuations evolve into incommensurate correlations with a characteristic in-plane wave vector of $q_m = (\delta, \delta)$ with $\delta = 0.14 \pm 0.04$ r.l.u. At low temperatures, an in plane magnetic field induces a sharp intra doublet resonant excitation at an energy $g\mu_B\mu_0 H$ with $g = 3.8 \pm 0.2$. The intensity is localized at the zone center and has a width in momentum space indicating precession of spin density extending $\xi = 6 \pm 2$ Å beyond the 4f site.

[1] C. Stock, C. Broholm, F. Demmel, J. Van Duijn, J. W. Taylor, H.J. Kang, R. Hu, and C. Petrovic, Phys. Rev. Lett. **109**, 127201 (2012).

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