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High energy magnetic excitations in Cr HYUNGJE WOO, BNL/ ISIS Facility/ U. of Tennessee, E. CLEMENTYEV, P. BÖNI, Physik Dept. E21, Garching, Germany, M. FUJITA, IMR, Tohoku Univ. Japan, T.G. PERRING, ISIS Facility, RAL UK, S.M. HAYDEN, Univ. Bristol, UK, G. SHIRANE, BNL — Pure Cr has a simple bcc structure but the magnetism is known to be rather complicated, and so far its properties are not yet understood well [1]. Below $T_N = 311K$ it is antiferromagnetic (AF) with an incommensurate (IC) spin density wave showing long-range order. We have used inelastic neutron scattering to map the dynamics of the spin density wave in a single-Q (i.e. untwined) single crystal of Chromium. We observe fluctuations of the magnetism wavevectors corresponding to the commensurate (1, 0, 0), the allowed IC positions (1$\pm\delta$, 0, 0) and the silent IC positions (0, 1$\pm\delta$, 0) at energies up to 83 meV. Interestingly, as the energy of the fluctuations increases, spectral weight moves from the IC peaks to smaller δ, becoming commensurate at around 64 meV. This behaviour, namely IC AF fluctuations that move to the commensurate position, is also a common feature observed in high-TC superconductors such $YBa_2Cu_3O_{6.6}$ [2], $La_{15/8}Ba_{1/8}CuO_4$ [3], and $La_{1.84}Sr_{0.16}CuO_4$ [4]. An understanding of the magnetism in the itinerant AF Chromium may well help unravel that in the high-TC superconductors. [1] E. Fawcett, Rev. Mod. Phys. 60, 209 (1988). [2] Hayden et. al. Nature 429, 531 ('04). [3] Tranquada et. al. Nature 429, 534 ('04). [4] Christensen et. al. Phys. Rev. Lett. 93, 147002 (2004).

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