

# HIGH WAVE VECTOR MAGNONS AT THE Fe(110) SURFACE

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Spin polarized electron energy loss spectroscopy (SPEELS) is a unique and novel technique enabling the studies of the high wave vector spin waves (SW) in thin films and surfaces [1,2]. For the first time the full spin wave dispersion has been recently measured for 2 monolayers (ML) Fe/W(110) film with this technique [3]. Here, we present the results of the SPEELS studies of the SW excitations in the Fe(110) surface. The surface mode dispersion has been measured for the 24 ML Fe/W(110) film along the [001] direction. The iron film is deposited using molecular beam epitaxy in ultra high vacuum at room temperature, and subsequently annealed, in order to obtain an atomically flat and clean Fe(110) surface. We find that the surface SW energies are lower than that in the bulk Fe, and even lower than the SW energies for the 2 ML Fe/W(110) film. However, for the states above  $1.0 \text{ \AA}^{-1}$ , an energy difference of the excitations in the 2 ML and 24 ML films diminishes with an increase of the wave vector. In contrary to the 2 ML Fe case, the spin wave peaks reveal characteristic broadening at higher energy losses related to the Stoner excitations, or to the excitations of the higher modes.

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9.7 cm