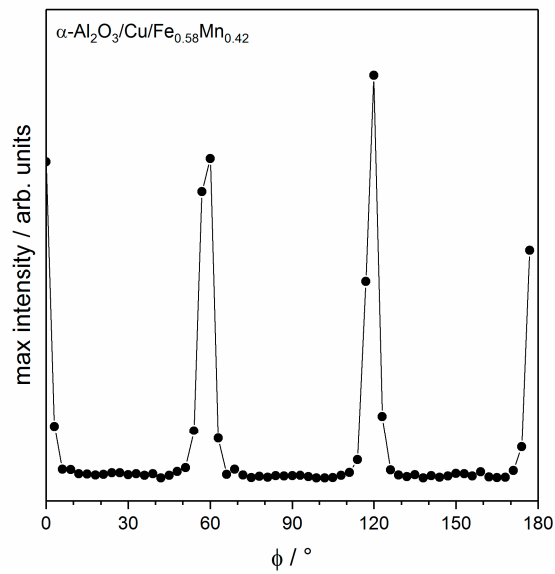
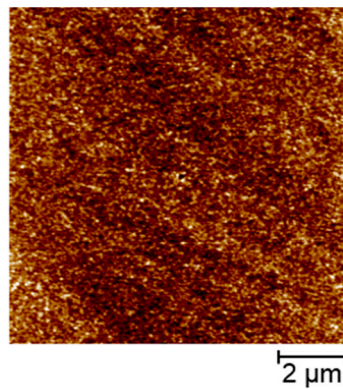


**Supplementary Material:**


**Figure S1.**  $\phi$ -scans of *fcc* (111) for  $\alpha$ -Al<sub>2</sub>O<sub>3</sub>/Cu/Fe<sub>0.58</sub>Mn<sub>0.42</sub> ( $2\theta = 43.39^\circ$ ,  $\omega = 21.70^\circ$ ,  $\chi = 20^\circ$ , frame width  $3^\circ$ , maximum intensities plotted in dependence of  $\phi$ ).



**Figure S2.** Representative surface area scans for the roughness determination of the FeMn thin film.