Supplementary Materials

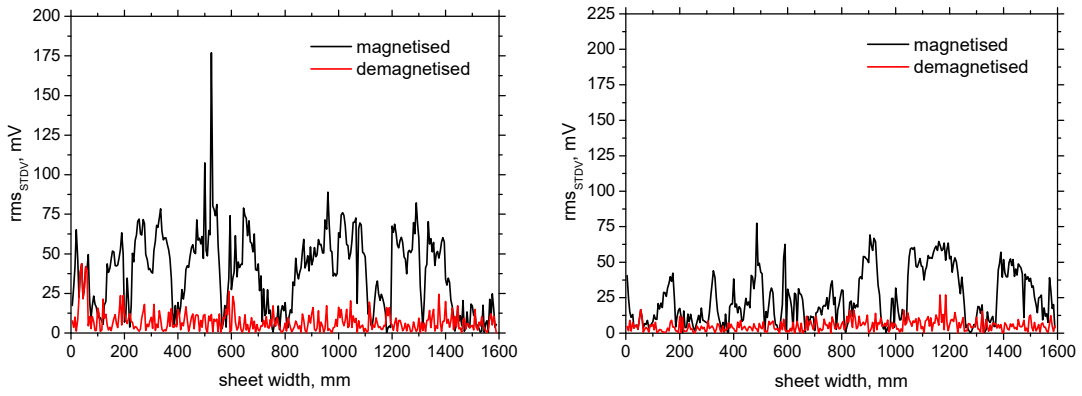

Figure S1. STDV of MBN before and after demagnetization – side A; **(a)** RD, **(b)** TD.

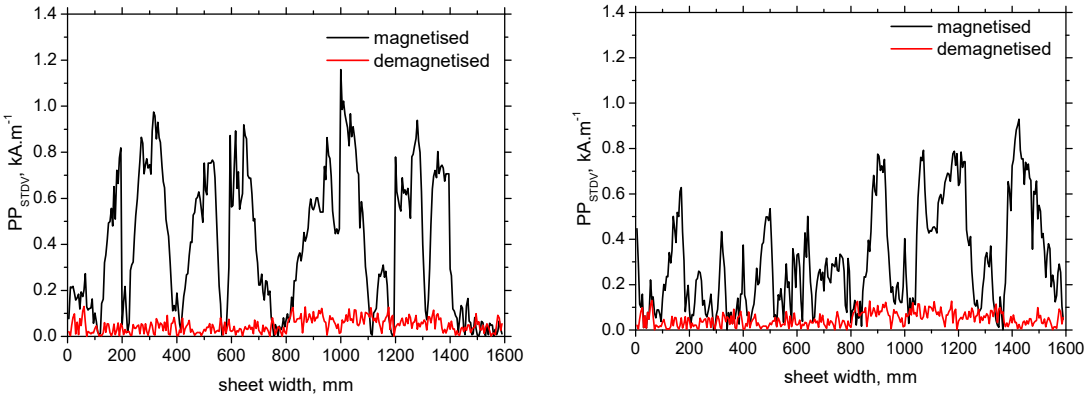

Figure S2. STDV of *PP* before and after demagnetization – side A; **(a)** RD, **(b)** TD.

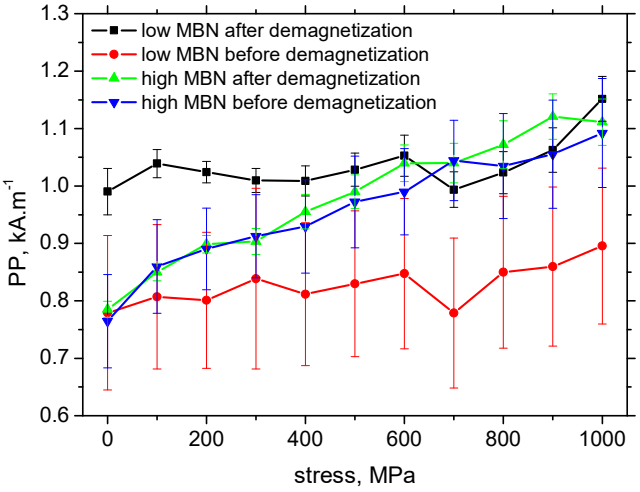

Figure S3. *PP* versus tensile stress in RD for the regions of high as well as low MBN before and after demagnetization.

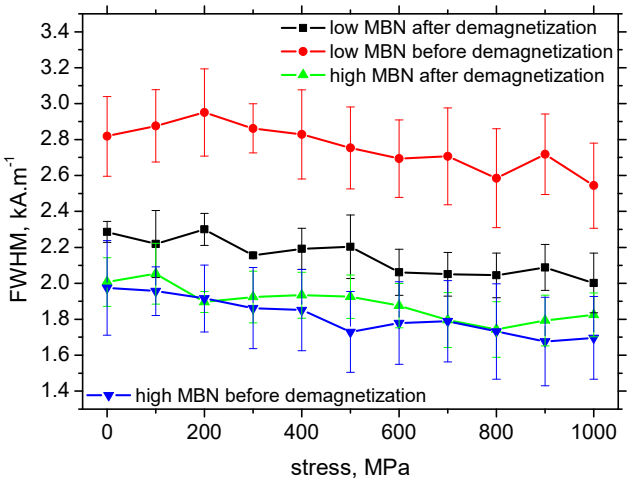

Figure S4. *FWHM* versus tensile stress in RD for the regions of high as well as low MBN before and after demagnetization.

PP values for the regions of high MBN exhibit quite flat evolution versus tensile stress; see Figure S3. The *PP* values for the magnetized state are remarkably lower than those for the demagnetized one and exhibit very high standard deviations. These deviations originate from different processes of matrix magnetization when the magnetic field is reversed due to the presence of the remnant magnetization. *PP* values for the regions of high MBN exhibit increasing *PP* along with increasing tensile stresses, which proves the information about the preferential DWs orientation in RD (the evolutions for the demagnetized and magnetized states are quite similar). The role of the remnant magnetization on the evolution of *PP* in TD is lower, but *PP* tends to drop down for lower tensile stresses. *FWHM* drops gently with the tensile stresses. The differences between *FWHM* in the regions of high MBN in the magnetized and demagnetized states are only minor, whereas the remarkably higher *FWHM* can be found for the magnetized state in the regions of low MBN as compared with the demagnetized state. The decrease of *FWHM* is only moderate, and the sensitivity of this parameter in this particular case is very limited, especially for the magnetized samples, due to the high standard deviation, see Figure S4.