Development of Mobile type X-ray stress measuring equipments using EDXDM(Energy Dispersive X-ray Diffraction Method)

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It developed a portable X-ray stress measuring equipment for the purpose of using in outside field by mean of energy dispersive X-ray diffraction method and X-ray parallel beam optics.
It was tested by conventional sin²θ method for the purpose of determination for the residual stress in the steel samples.
A CdTe detector was chosen because of good detecting efficiency and compact size in spite of not good energy resolution as a result of comparing PIN, SDD, P-Si and P-Ge.
The measured diffraction peak energy drifts slightly by the influence of environmental temperature. It revised a drift with the diffraction peak energy by Fe-Kα X-ray fluorescence of the steel because of the measurement accuracy improvement.
It used a parallel X-ray beam method for the X-ray optical system. It got a parallel X-ray beam by poly-capillary and Solar slit.
As a result, it got the value of statistical error 20MPa in the steel sample of compressive residual stress 700MPa by the shot-penning.

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