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COMPARISON OF MAGNETIC FIELDS BY D1, D2 AND NiI 5892.9 LINES MEASURED IN THE AREAS OF THE SEISMIC SOURCE OF A POWERFUL SOLAR FLARE AND IN A SUNSPOT WITHOUT FLARES

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The results of magnetic field measurements by the D1, D2 NaI and NiI 5892.883 lines are presented for area of the seismic source of the powerful solar flare on October 28, 2003 of X17.2/4B class. For comparison, similar data are presented for a large sunspot of AR NOAA 3379 on July 24, 2023, where at the time of observations no flares were observed. For D1 and D2 lines, the magnetic fields in the flare on October 28, 2003 were measured by the splitting of emission peaks, and in the sunspot on July 24, 2023 – by the splitting of Fraunhofer profiles. For the NiI line, magnetic fields were measured by the splitting of Fraunhofer profiles only. The magnetic fields measured by direct method were in the range of 900-1400 G for the flare and 500-1700 G for the sunspot without flares. It is interesting to note that magnetic field ratio by D2 and D1 lines, $B(D2)/B(D1)$, was 1.6 for the flare and 1.7-1.8 for the sunspot without flares. Since the Lande factors of these lines are 0.75 and 1.33, respectively, these data in frame of the "line ratio" method indicate a spatially unresolved magnetic field structure in the picture plane with even stronger local magnetic fields. Estimation of the lower limit of local fields at the level of the chromosphere by this method leads to magnetic fields in the range of 3500-5200 G, that is, several times stronger than according to direct measurements. The significant heterogeneity of the magnetic field in the vertical direction of the flare is evidenced by the fact that an almost zero magnetic field was measured by the NiI line, while in the sunspot without flares – approximately the same magnetic field as by the D1 and D2 lines.