THREE-MINUTE OSCILLATIONS IN SUNSPOT'S SUPERPENUMBRAE. ALFVÉNIC OR SOUND?

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The photosphere and chromosphere of sunspots' superpenumbrae are populated by areas of 3-minute oscillation power in the line-of-sight (LOS) velocity oscillations and intensity signals. Such oscillations are also found in the transition region and lower corona above active regions. The goal of the work is to clarify whether these LOS velocity oscillations are manifestations of Alfvénic waves in the lower solar atmosphere, as some researchers suggest they are. The study is based on three sunspots with the use of the Solar Dynamics Observatory data. We conclude that the 3-minute oscillations in the LOS velocity signals result from magnetoacoustic waves rather than from Alfvénic waves. However, oscillations registered in magnetic field signals indicate that Alfvénic waves may be present already in the photosphere.