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A possible mechanism of high-speed solar wind formation in coronal holes

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The problem of the formation and acceleration of the solar wind is one of the most important of the solar physics. The regions of open configurations of the magnetic fields related to coronal holes are believed to be a source of formation of high-speed solar wind streams. The high-speed streams are characterized by high temperature and low density. High-speed and low-speed streams of the solar wind differ not only by the speed, density of the plasma, and its composition, but by the character of variability as well. The SOHO/UVCS has revealed large temperatures, outflow speeds, and velocity distribution anisotropies for positive ions in coronal holes. In this study it has been found that the maximum velocities of the solar wind are observed in the cases when coronal holes are located in the vicinity of active regions and when coronal holes are registered simultaneously in all wavelength. High-speed streams of the solar wind do not concentrate to the centers of the coronal holes registered at coronal level. The structure of the photosphere magnetic field in such regions differs significantly from that of quiet regions. The deepest layers of the solar atmosphere down to the photosphere are involved in the formation of the high-speed streams. The presence of the adjoining active regions is of a great importance for their formation. Coronal hole structure changes with height. The data from space observatories show that there are active processes at the chromospheric network in the zones of coronal holes location. The differences were detected in the structure of the high-chromosphere and low-transition-region network between the regions of coronal hole location and quiet regions. It seems that high-speed streams of the solar wind are generated directly in the chromospheric network at the basis of coronal holes and that possibly highfrequency waves are generated in the process of a small-scale reconnection. A possible

mechanism of high-speed solar wind stream formation in coronal holes is presented.