Dependence of temperature and thermal pressure of the solar wind on its velocity and density

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Taking into account both electron and proton components the dependence of solar wind temperature and thermal pressure on solar wind velocity and density was analyzed. We used the 1-minute data from the WIND satellite for year 1995 when high-speed flows from coronal holes were often observed. We found that thermal pressure decreases when solar wind velocity increases. This holds true independently on the time scale of the data averaging (from 1 minute up to 1 day). The main input into this dependence is produced by the electrons. Both electron and proton temperatures decreases when solar wind plasma density increases. We found that $\ln T = (\gamma - 1) \cdot \ln N + \text{const}$, where $T = T_e + T_i$, and factor $\gamma \approx 0.6$. We also noted that anisotropy of the electron temperature increases from 1 to 1.6 when solar wind velocity increases from 300 to 800 km/s.