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STUDY OF THE MECHANISM FOR SOLAR WIND FORMATION

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This paper analyses the observations in the corona and solar wind and compares them with generalized results, derived from laboratory-scale experiments to show that a major contribution to a precipitating plasma of the solar wind that emanates from coronal holes, may be made by a thermal pressure gradient. It is found that the divergence

$\phi = \left(\frac{R}{R_0}\right)^2 f$ of magnetic field lines, originating from coronal holes, is one of the factors, governing the solar wind velocity v at earth orbit ($R = 1AU$). A decrease in velocity $v_{R=1AU}$ from $\approx 750 \text{ km s}^{-1}$ down to $\approx 450 \text{ km s}^{-1}$ may be attributable to an increase in superradial divergence f from $\approx 7 - 9$ to ≈ 20 . The plasma energy flux density F at the base of coronal holes which represent the sources of a solar wind with $v_{R=1AE} \approx (450 \text{ to } 750) \text{ km s}^{-1}$, remains nearly constant, being $F \approx (1.4 \pm 0.3) \cdot 10^6 \text{ erg} \cdot \text{cm}^{-2} \cdot \text{s}^{-1}$ for the period 1973-1975.