STUDY OF THE MECHANISM FOR SOLAR WIND FORMATION

V.G. Eselevich and M.A. Filippov
SibIZMIR, Irkutsk 33, P.O. Box 4, 664033 U.S.S.R.

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 \( \mathbf{v} \) 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 \( \approx 20 \). The plasma energy flux density \( F \) at the base of coronal holes which represent the sources of a solar wind with \( v_{R=1AU} = (450 \text{ to } 750) \text{ km s}^{-1} \), remains nearly constant, being \( F \approx (1.4 \pm 0.3) \times 10^6 \text{ erg cm}^{-2} \text{ s}^{-1} \) for the period 1973-1975.