<https://iopscience.iop.org/article/10.1088/0004-637X/731/2/112/pdf>

There are two types of solar wind: fast wind and slow wind. Fast wind has speeds greater than 600 km/sec, while slow winds are less than 500 km/sec. Fast wind comes from coronal holes which have lower plasma density than the surrounding corona. Fast wind is considered to be a steady wind, whereas slow wind is non steady and is much less understood. Slow wind surrounds the heliospheric current sheet, the area where the Sun’s polarity changes from north to south. The winds have different chemical compositions, which is considered a better way to differentiate the two than simply speed. The paper argues that slow wind comes from closed-field corona. Open fields are where the lines stay attached to the Sun and get dragged out with solar wind, and closed fields are where the magnetic fields are attached to the Sun and stay active close to the corona.

The authors constructed a model that allows for plasma from closed fields to be released onto the open field, where they can get dragged by solar winds. The open field has two coronal holes, a large one at the pole and a smaller one elsewhere, that are connected by an ‘open-field corridor’. If the corridor is narrow, an evolving photosphere will change the location of the corridor. These changes need field lines to open and close, which releases the closed field plasma. This kind of field can be approximated with dipoles.

An issue with this model is that it doesn’t create enough corridors for the amount of observed slow wind. They calculated a quasi-steady model of the flux in the photosphere, assuming a specific form of coronal heating. The boundary between the open and closed fields is a separatrix surface, and the model shows that there are many of these surfaces in the heliosphere, which they called the S-web. This S-web resolves the dilemma because it allows for solar winds to exist further from the HCS.

<https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2002JA009284>

This paper begins by explaining how loops of magnetic flux interact with each other and form new loops. Large loops are formed by combining smaller loops, not from simply a large loop coming into being. As the loops are formed and combined, the open field lines get moved to balance out polarity. The energy provided from this displacement forms the solar wind. In a given volume, by moving the field line, the energy density increases and the volume will expand, which is similar to creating magnetosonic waves that transmit energy into the atmosphere.

If you have a coronal loop and an open field line, one end of the loop can connect with a different open field line which will in turn be moved to follow the same path as the first field line, doubling the magnetic flux. The loops have mass, and this mass is released into the corona when the loops reconnect. A lot of math goes on to state that the final speed of solar wind depends on the temperature of the mass in the loops, with v2/2 proportional to 1/T, or the speed squared is inversely proportional to mass flux, since mass is proportional to temperature. This does use the temperature of the electrons instead of the loop temperature, but these should be approximately equal.