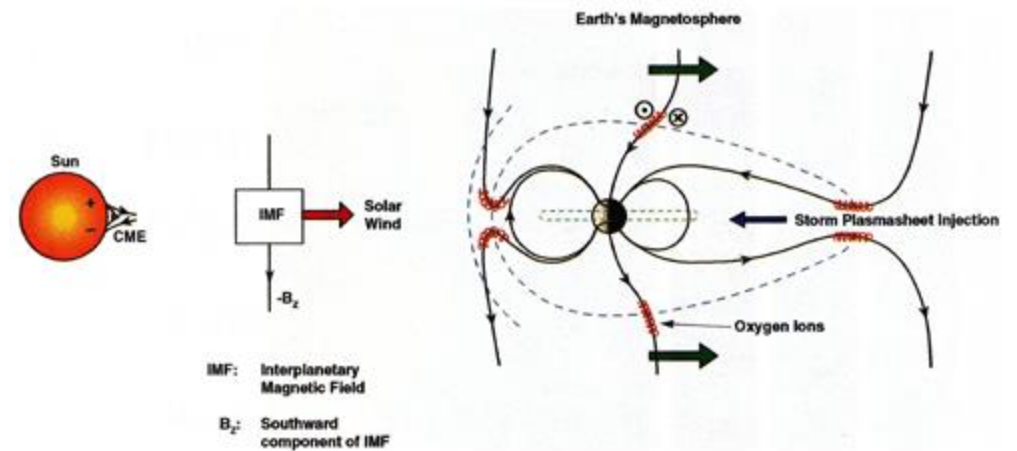


# NASA SPACEAPPS CHALLENGE 2023

## PROJECT ON MAGNETIC RECONNECTION FREQUENCY ESTIMATOR

BY:-CME\_SEEKERS



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# Why Bz Component is assessed and used for estimating magnetic reconnection frequency ?

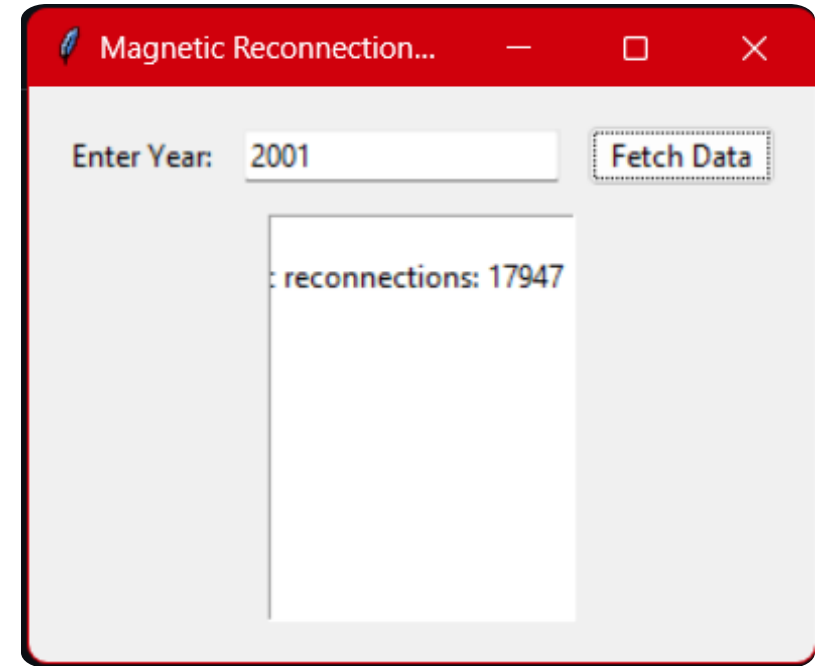
- If the Bz is southward (recorded as negative values in the ACE data), then the IMF field lines are pointing in the opposite direction as earth's magnetic field lines. When this alignment occurs, it allows for the reconfiguration of earth's magnetic field lines by an energy transfer process called magnetic reconnection. Southward Bz acts in such a way to "peel" the magnetic field lines from the sun magnetosphere and layer them on the night in the magnetosphere's long tail. A la southward Bz value allows for a more effective energy transfer from the sun's magnetic field lines to the earth's and this creates a more vibrant aurora



Where Data  
is obtained  
from to assess  
the magnetic  
reconnection

- The data for this study were obtained from the database in the World Data Center and OMNIWeb. The plots of Bz, Solar Wind plasma speed and Dst index were obtained from <https://omniweb.gsfc.nasa.gov/form/dx1.html>, the plots of Bz against solar wind speed was obtained from [https://omniweb.gsfc.nasa.gov/form/om\\_scatter\\_min.html](https://omniweb.gsfc.nasa.gov/form/om_scatter_min.html)

- Our program is based on ACE data ranging from 2000 to 2019 which sought for southward Bz component and returns the frequency of the same. This gives as an overview how frequent magnetic reconnections occur every year.



Program Output

Good Evening!

## **GEOSTORM PREDICTOMETER**

**HP30: 2.23**

**HP60: 4.37**

**Kp: 7**

**Geomagnetic Storm: Danger**

**Space Weather Alert: Geomagnetic Storm Warning!**

**Current Time: 08:04 PM**

### **Surviving Solar Flares in Style:**

1. Stay cosmically chic with space weather updates.
2. Shield your gadgets from solar dazzle, darling.
3. Navigate the stars cautiously, don't lose your way!
4. Embrace the auroras, darling! They're the galaxy's runway.

- We also have developed a geomagnetic storm prediction website which can alert about strength and various parameters such as Kp value etc.
- It has utilized various data sets from NASA organization for accurate prediction