### Long-Term Evolution of the Geospace Climate

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Heliophysics III Summer School

When I was a lad, a tiny wee lad My mother said to me Come see the Northern Lights my boy They're bright as they can be She called them the heavenly dancers Merry dancers in the sky I'll never forget, that wonderful sight They made the heavens bright









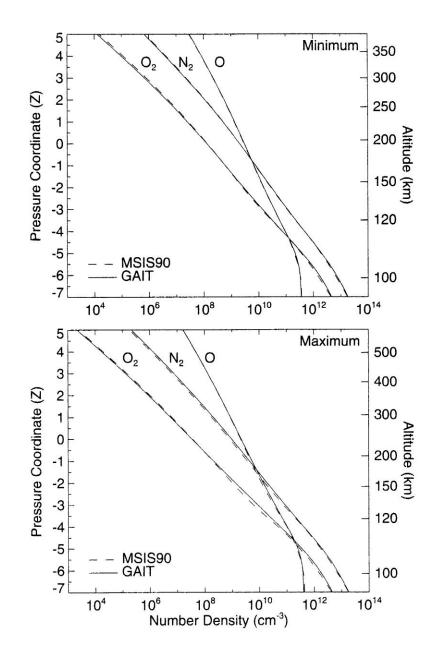




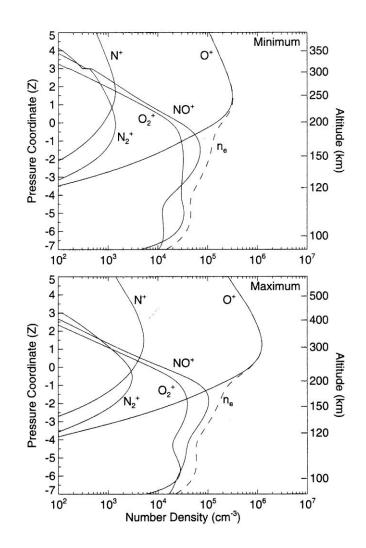
#### **Solar Photon Radiation**



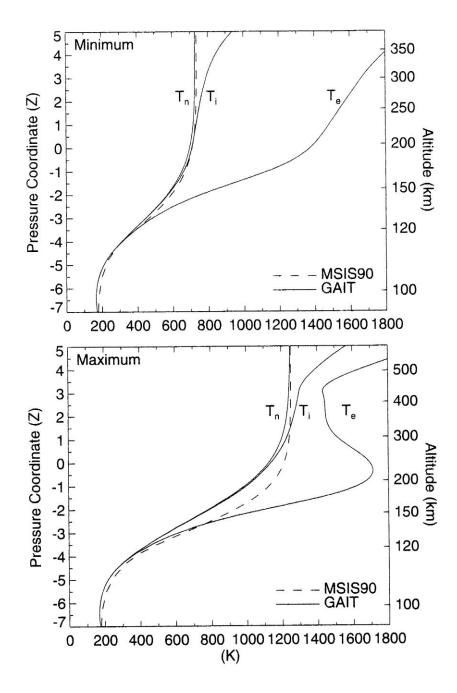
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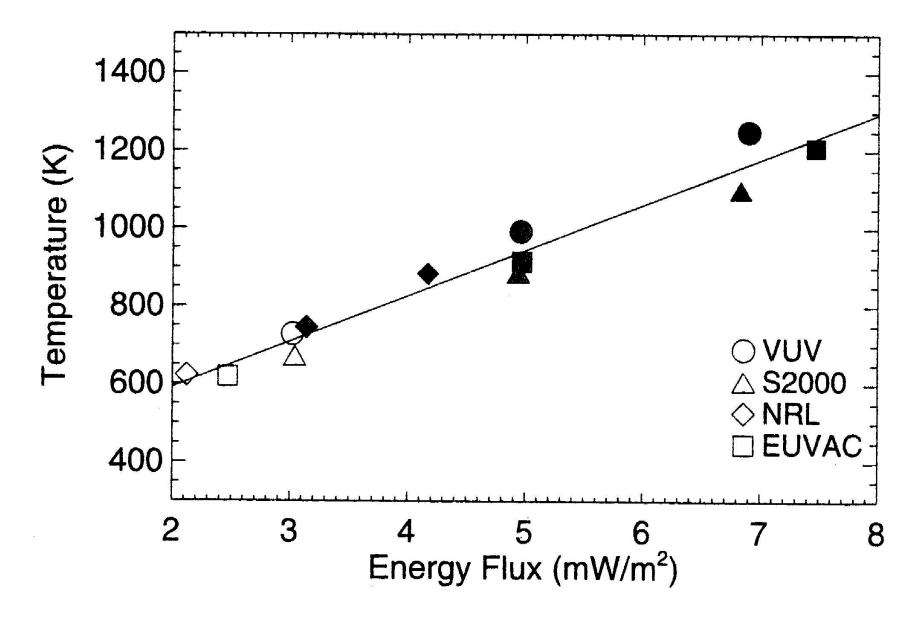








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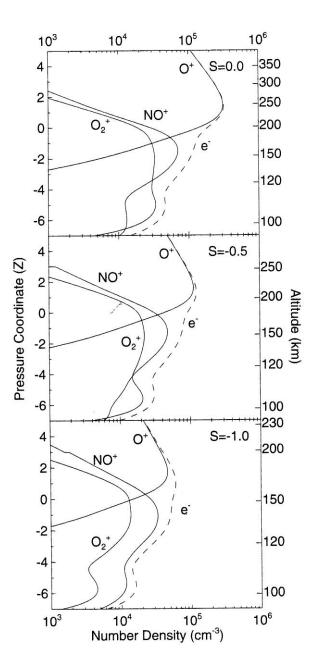




#### Maunder Minimum



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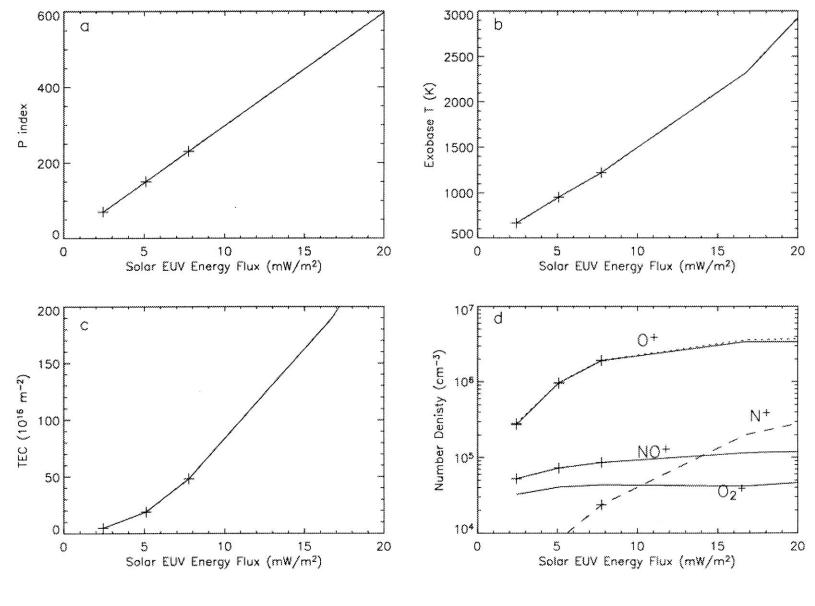




#### **Extreme Maxima**



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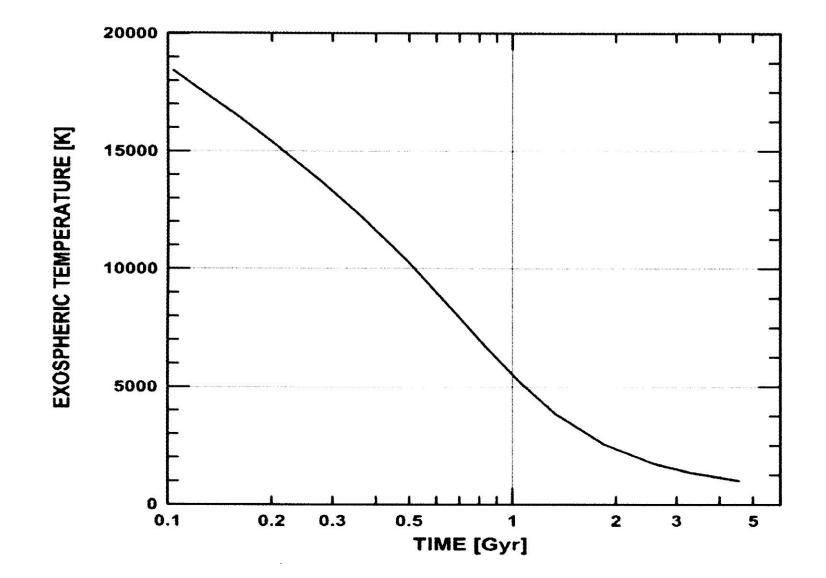




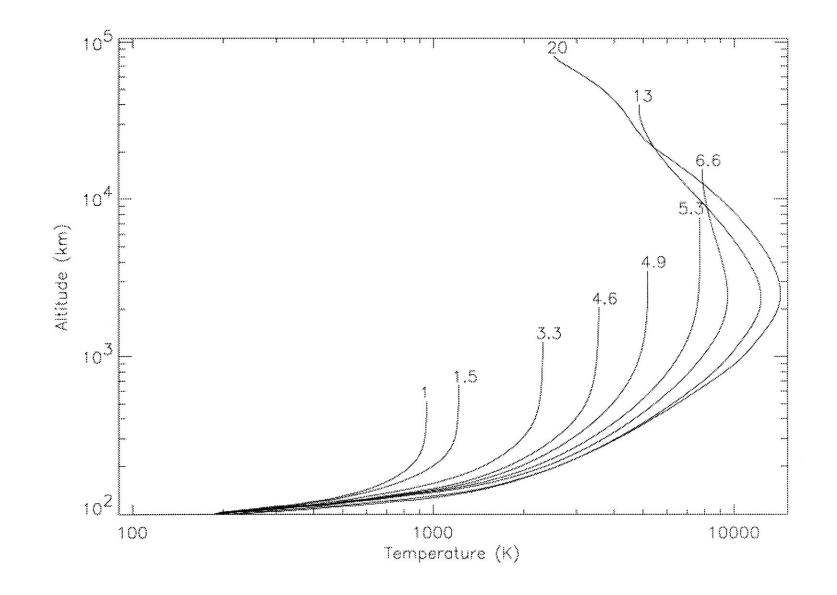
## Billions of years ago!



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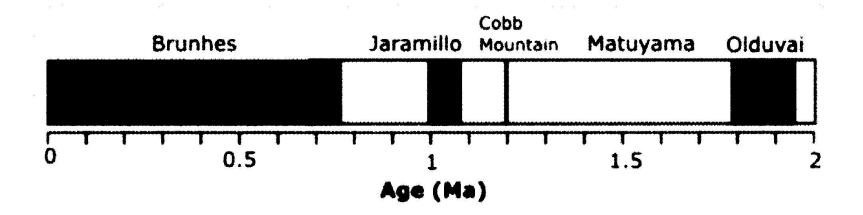




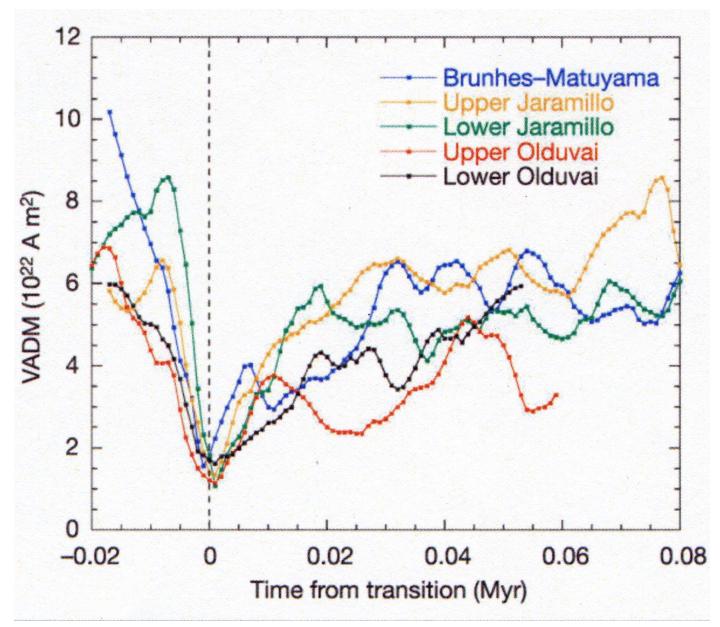
#### Dipole Field----flips



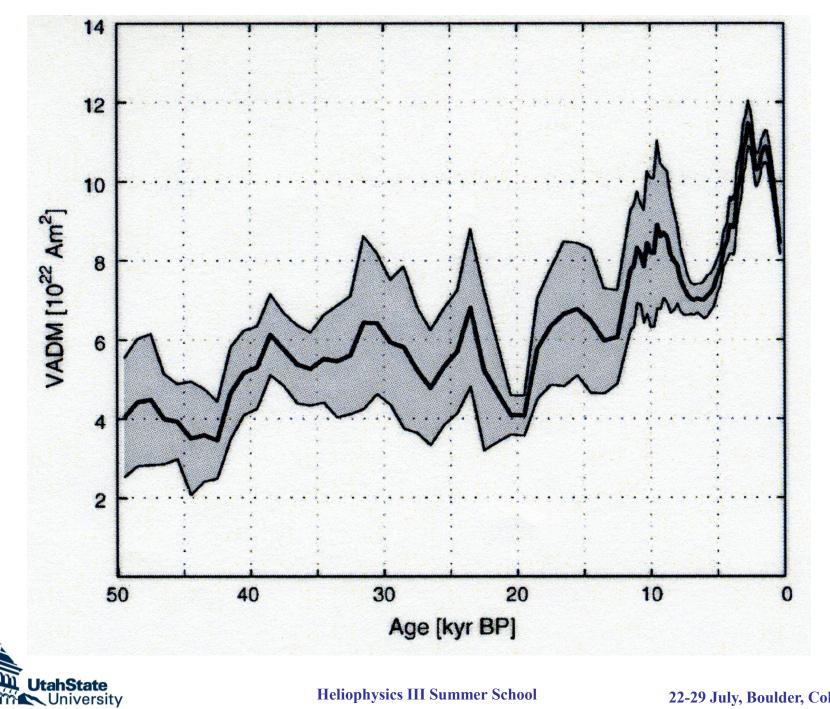
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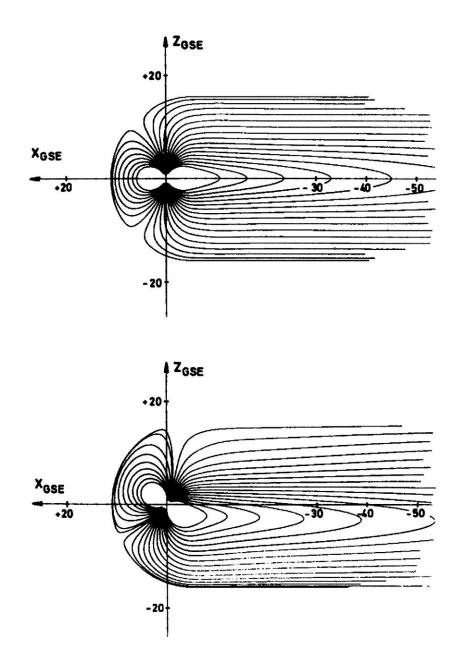










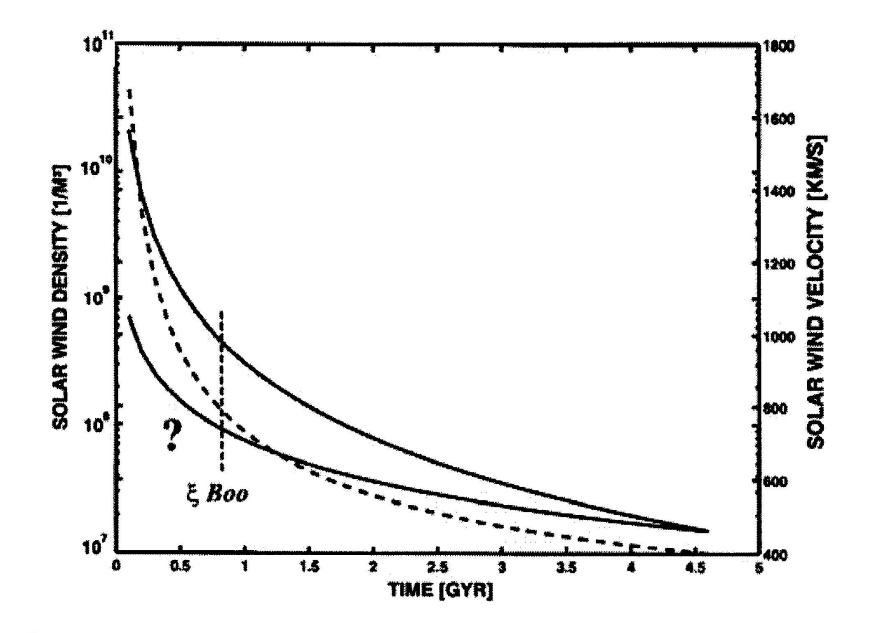




### Solar Wind in the distant past



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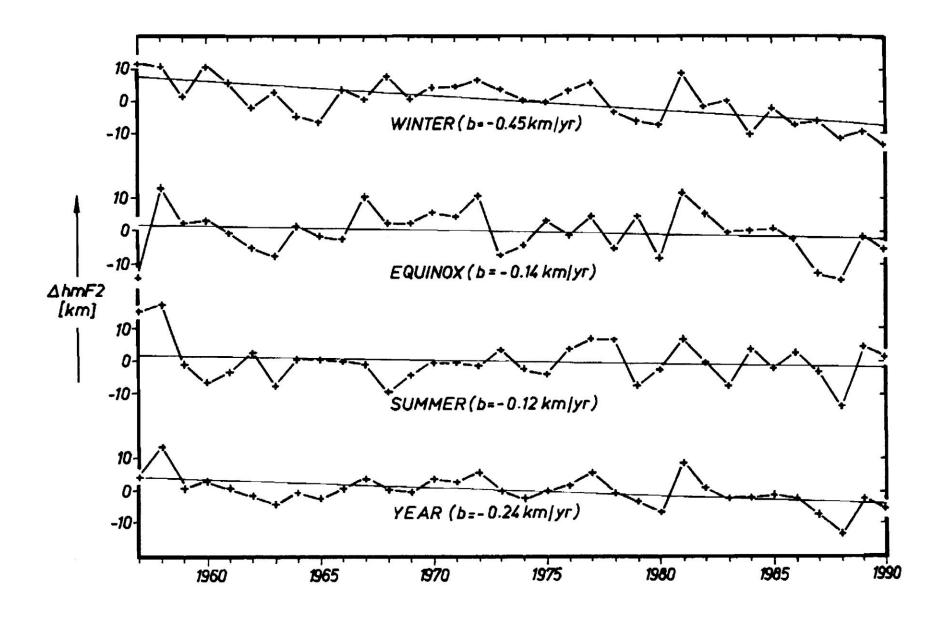




# Anthropogenic sources of geospace climate change



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