Celebrating
31 Years
of
Barbara Emery


Please,

1986 +

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DATE

ASSIGNMENT Summer · Kathryn Drake
Cedar Seminar

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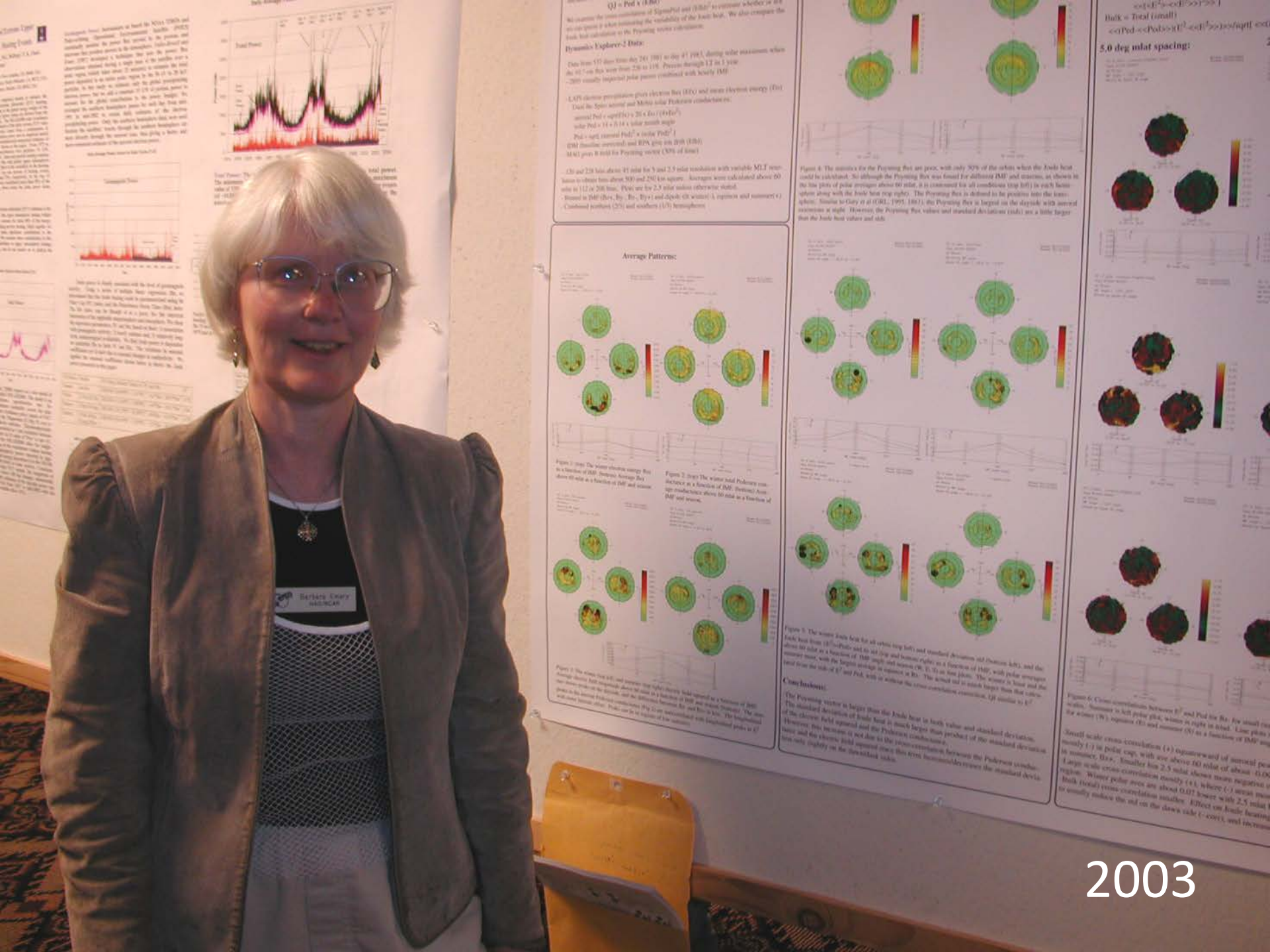
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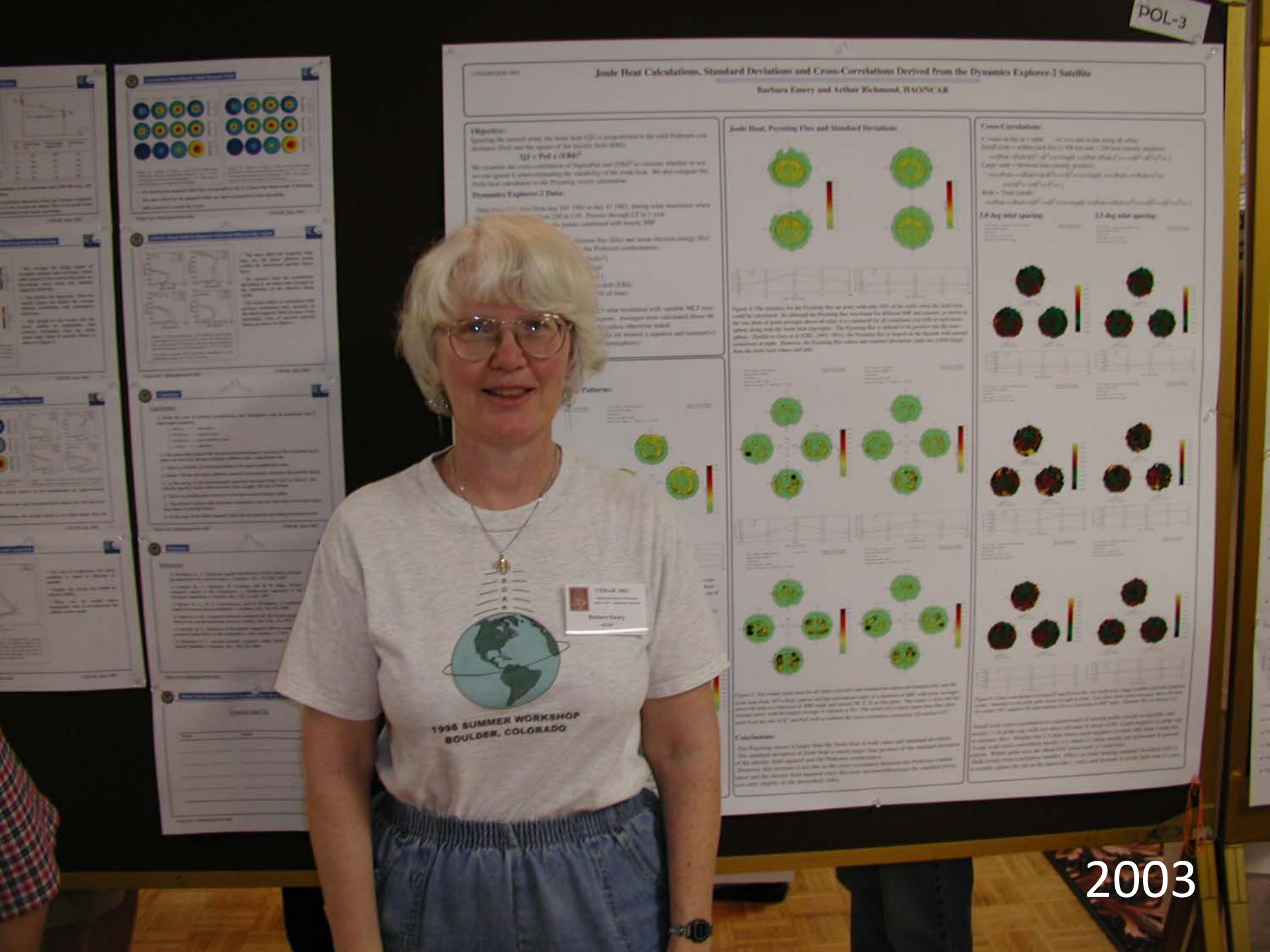
POL-3
Joule Heat Calculations, Standard Deviations and Cross-Correlations Derived from the Dynamics Explorer-2 Satellite
Barbara Emery and Arthur Richmond, HAO/NCAR
1998 SUMMER WORKSHOP
BOULDER, COLORADO
2003

Flood in Snowmass 2003

2003


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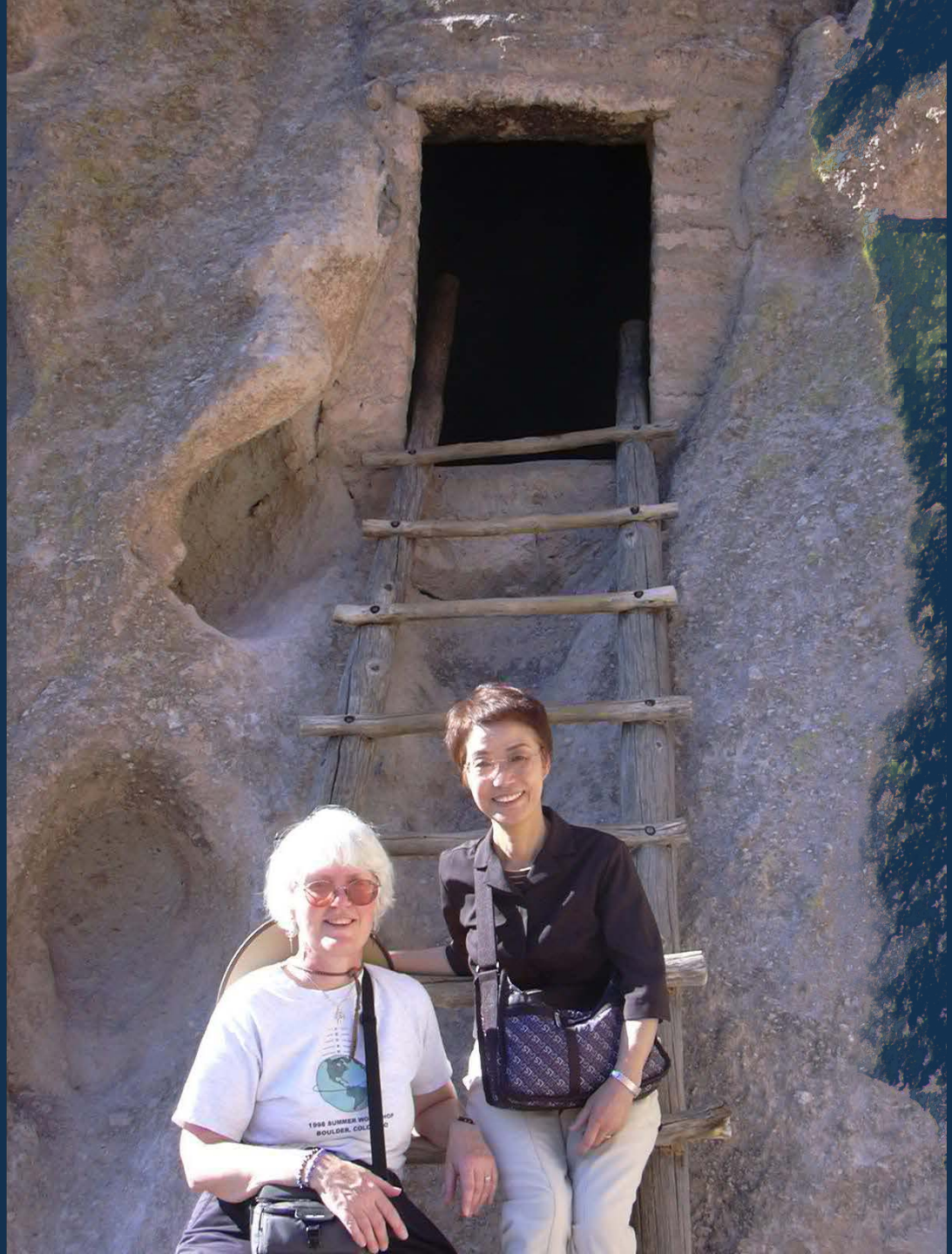

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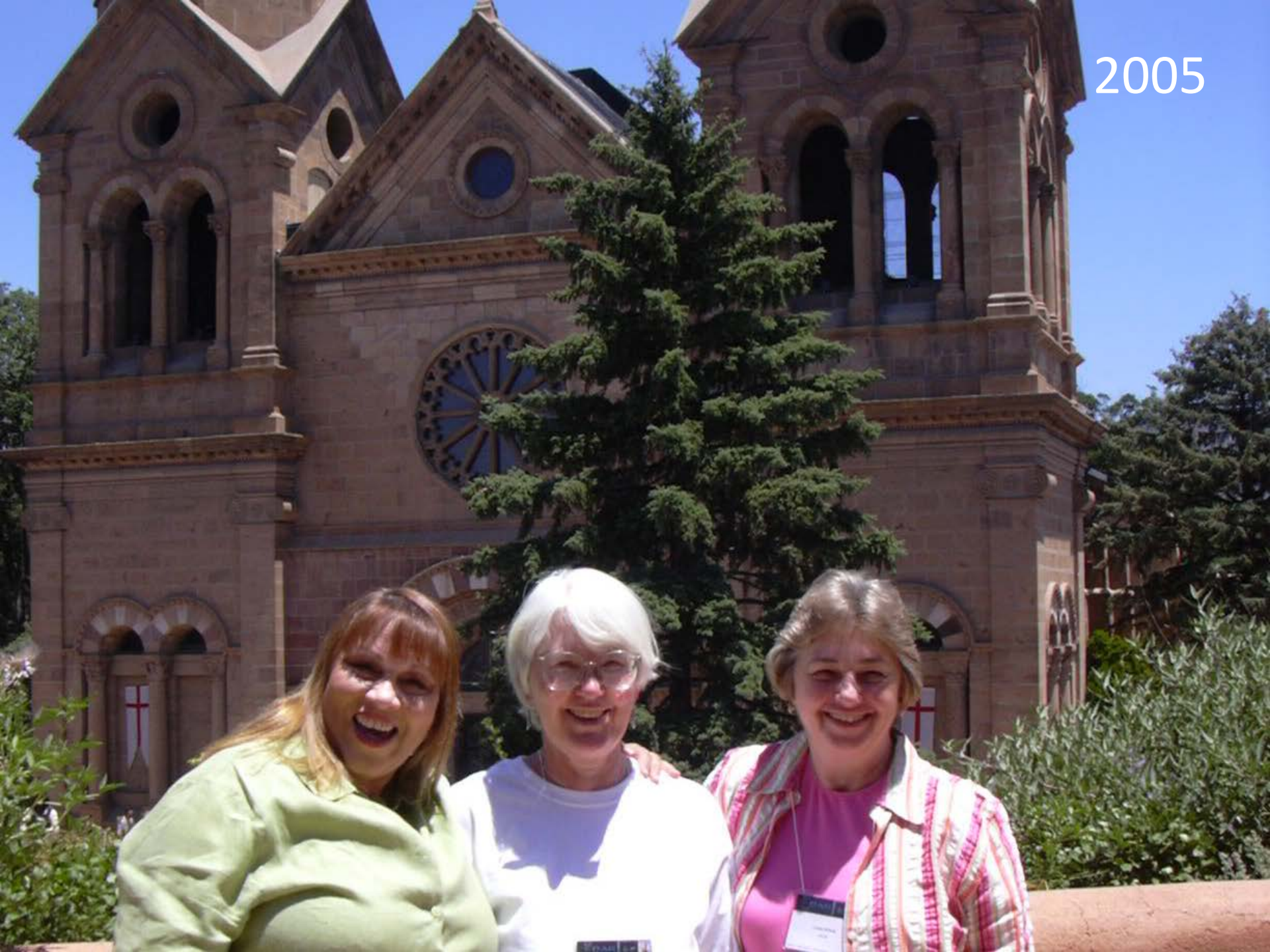
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CEDAR
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Santa Fe, NM
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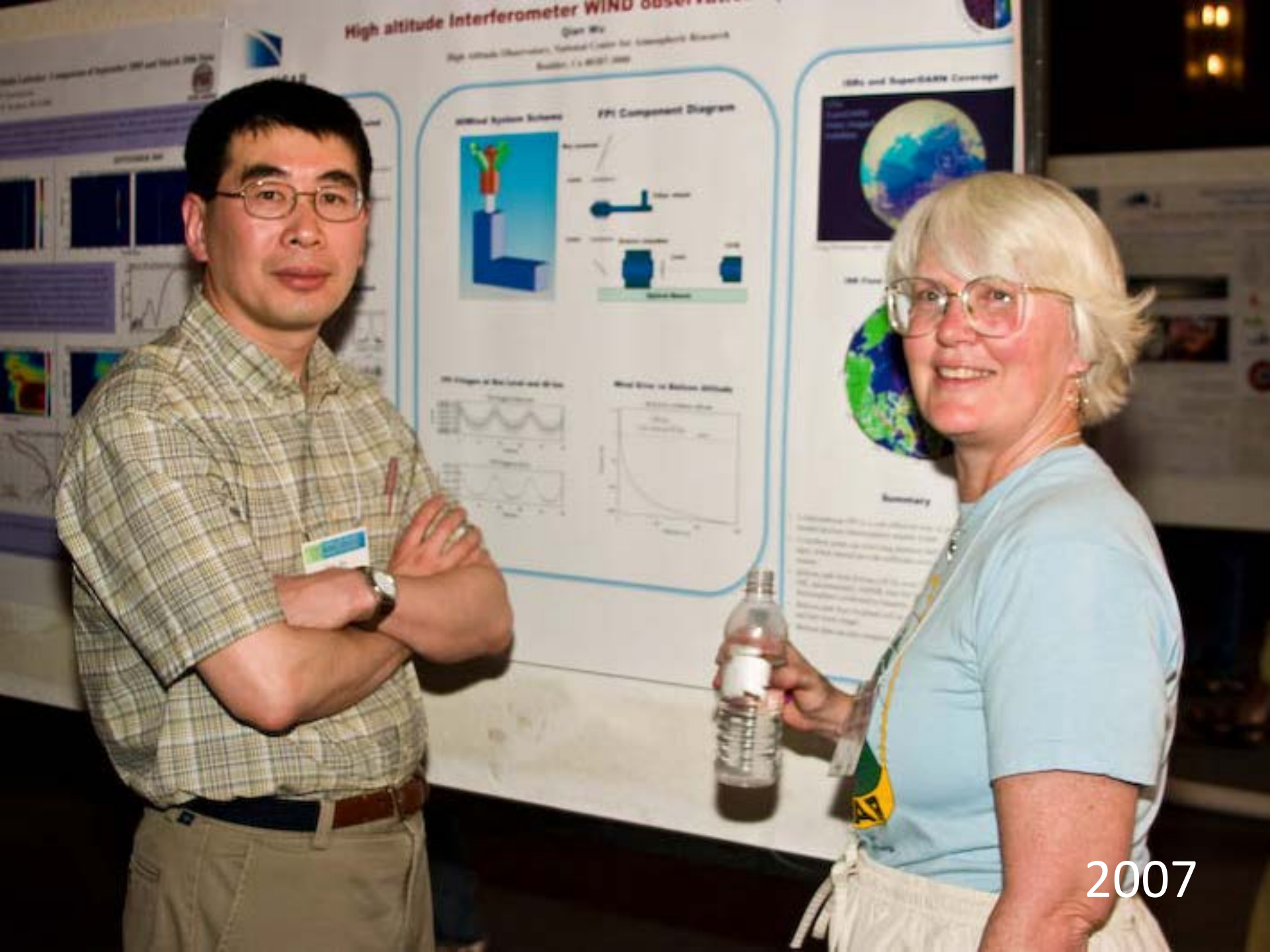
High altitude Interferometer WIND
FPI Component Diagram
Summary
2007


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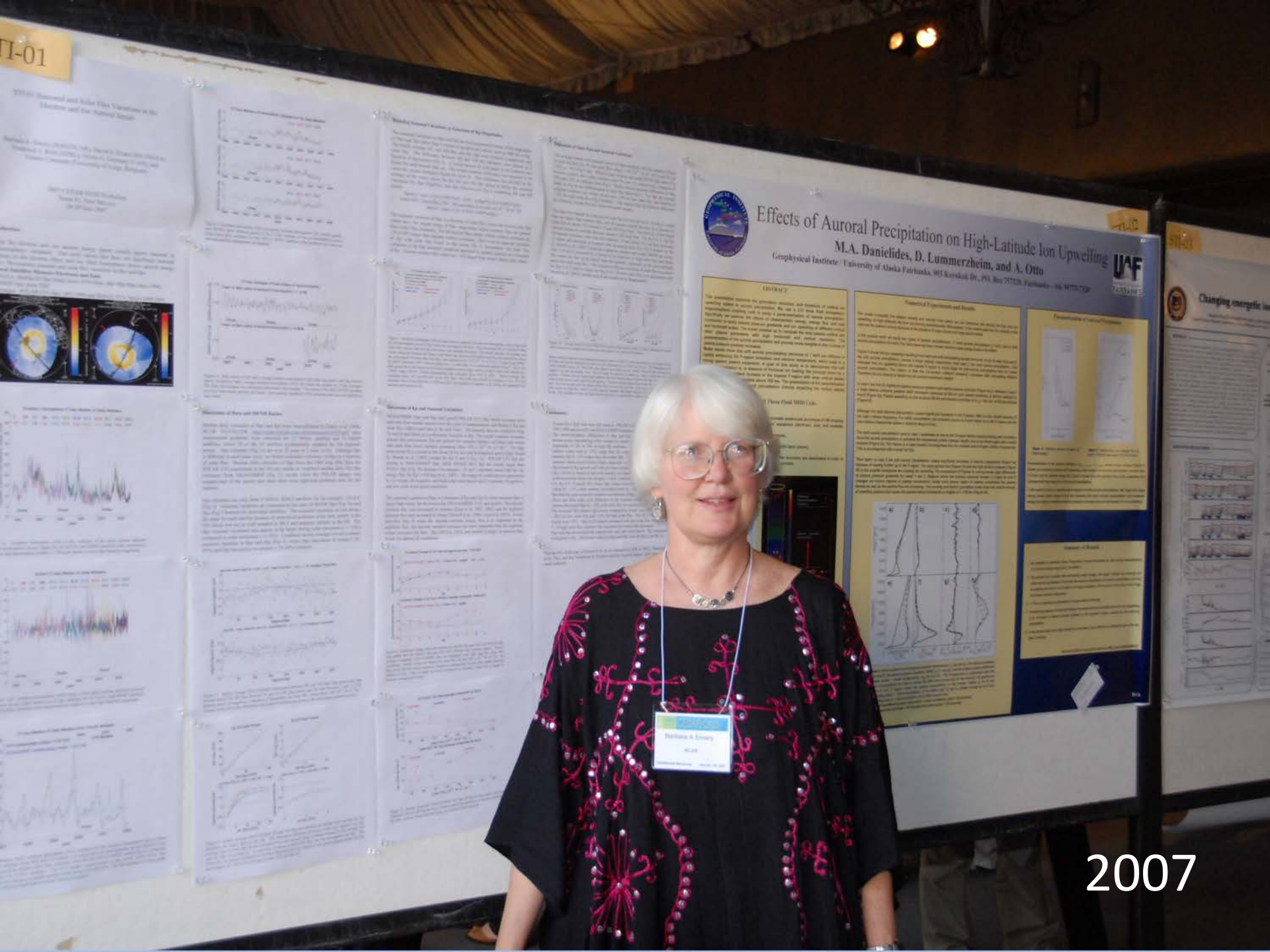
Effects of Auroral Precipitation on High-Latitude Ion Upwelling
M.A. Danielides, D. Lummerzheim, and A. Otto
Geophysical Institute / University of Alaska Fairbanks
UAF
2007


2007


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CEDAR
GOOSTEP
2001
A SPACE SCIENCE ODYSSEY
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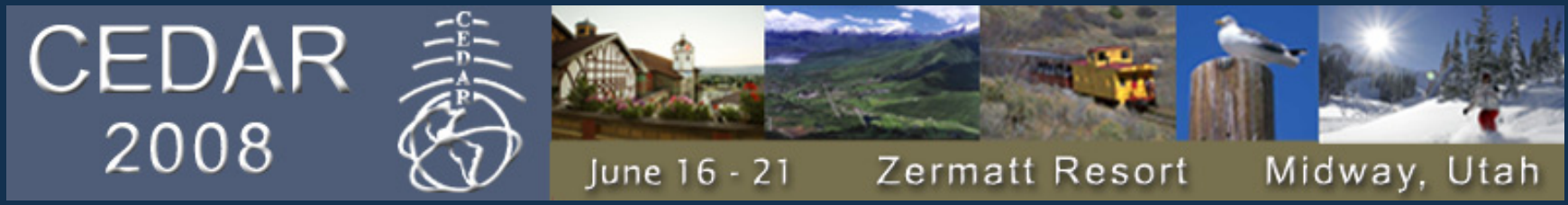
CEDAR
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CEDAR
June 16 - 21
Zermatt Resort
Midway, Utah


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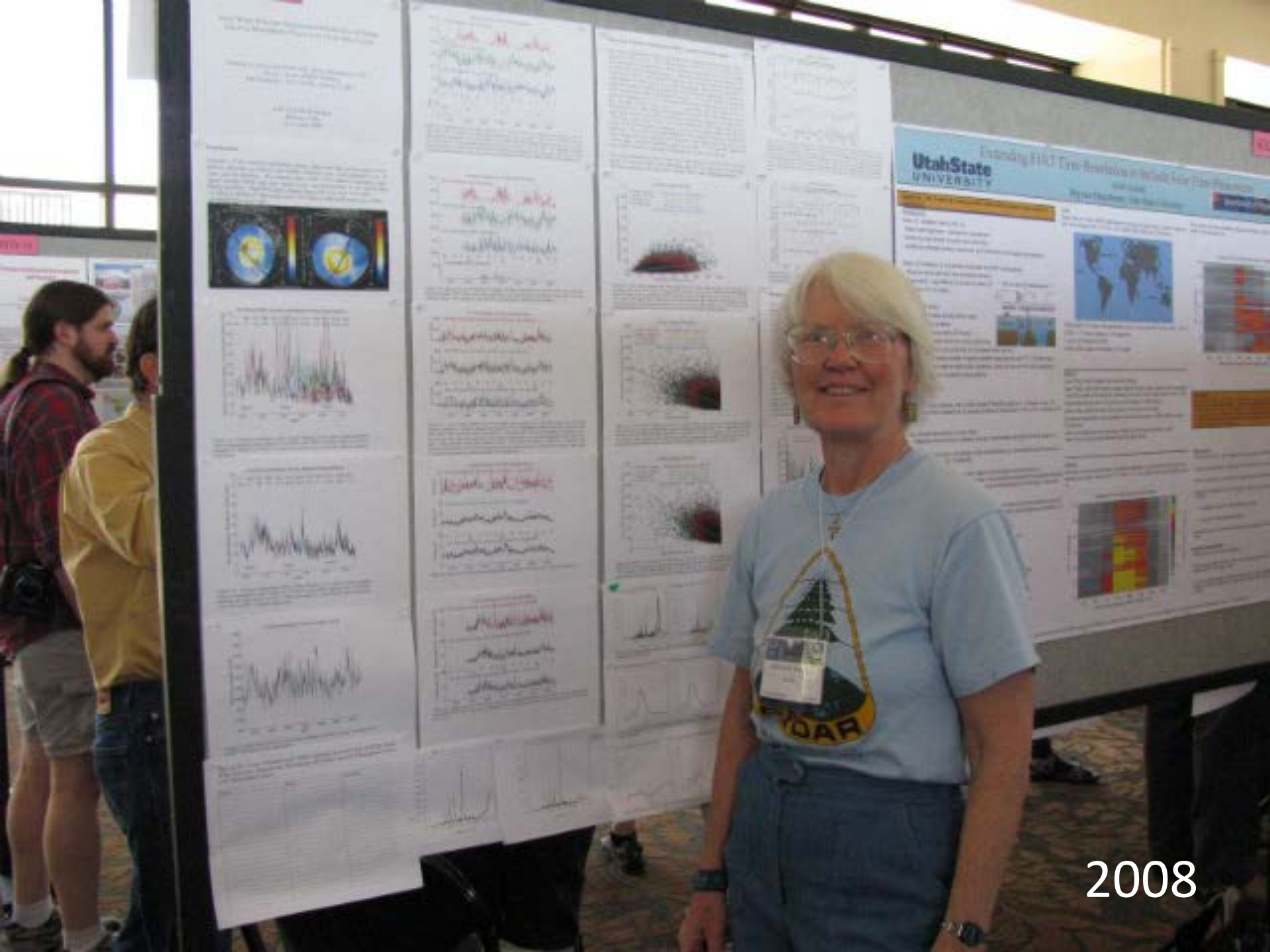
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June 28 - July 2
Eldorado Hotel Santa Fe, New Mexico


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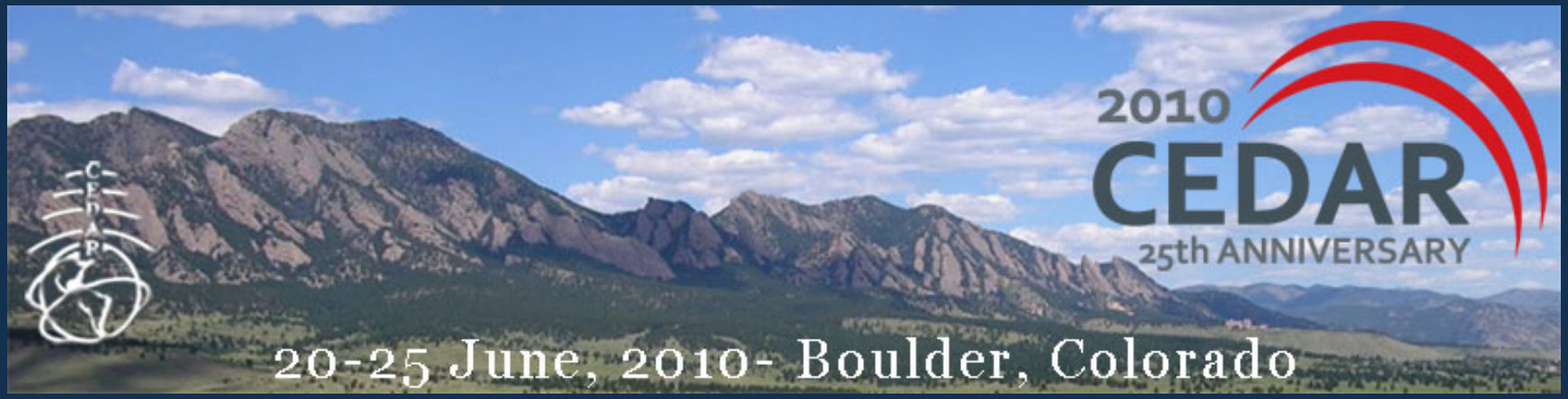
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25th ANNIVERSARY
20-25 June, 2010- Boulder, Colorado


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CEDAR
Barbara A. Emery
NCAR HAO
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CEDAR
20-26 JUNE - BOULDER, CO

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CEDAR
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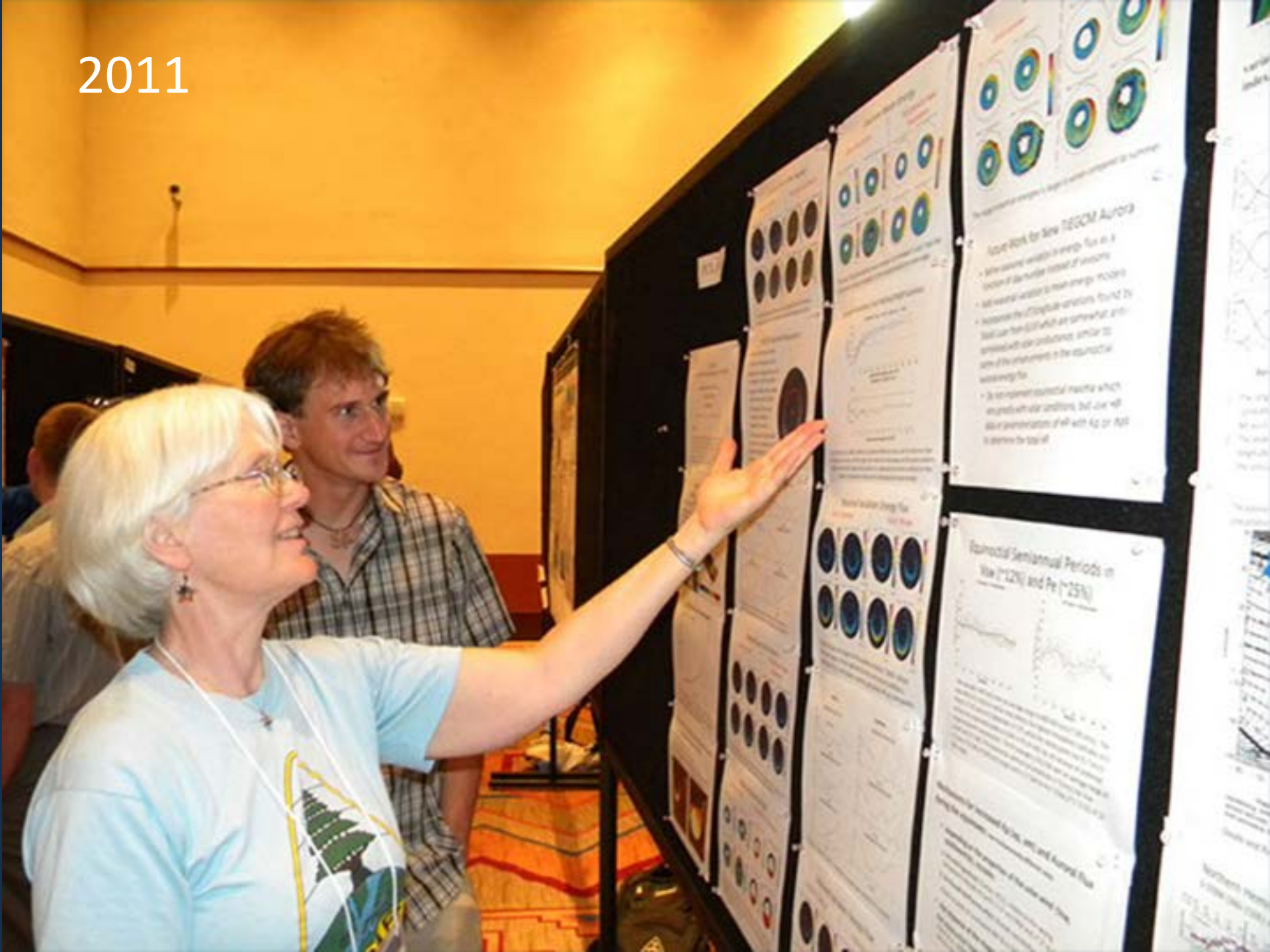
CEDAR
CEDAR-GEM Joint Workshop
GEM
26 June - 1 July 2011 ~ Santa Fe, New Mexico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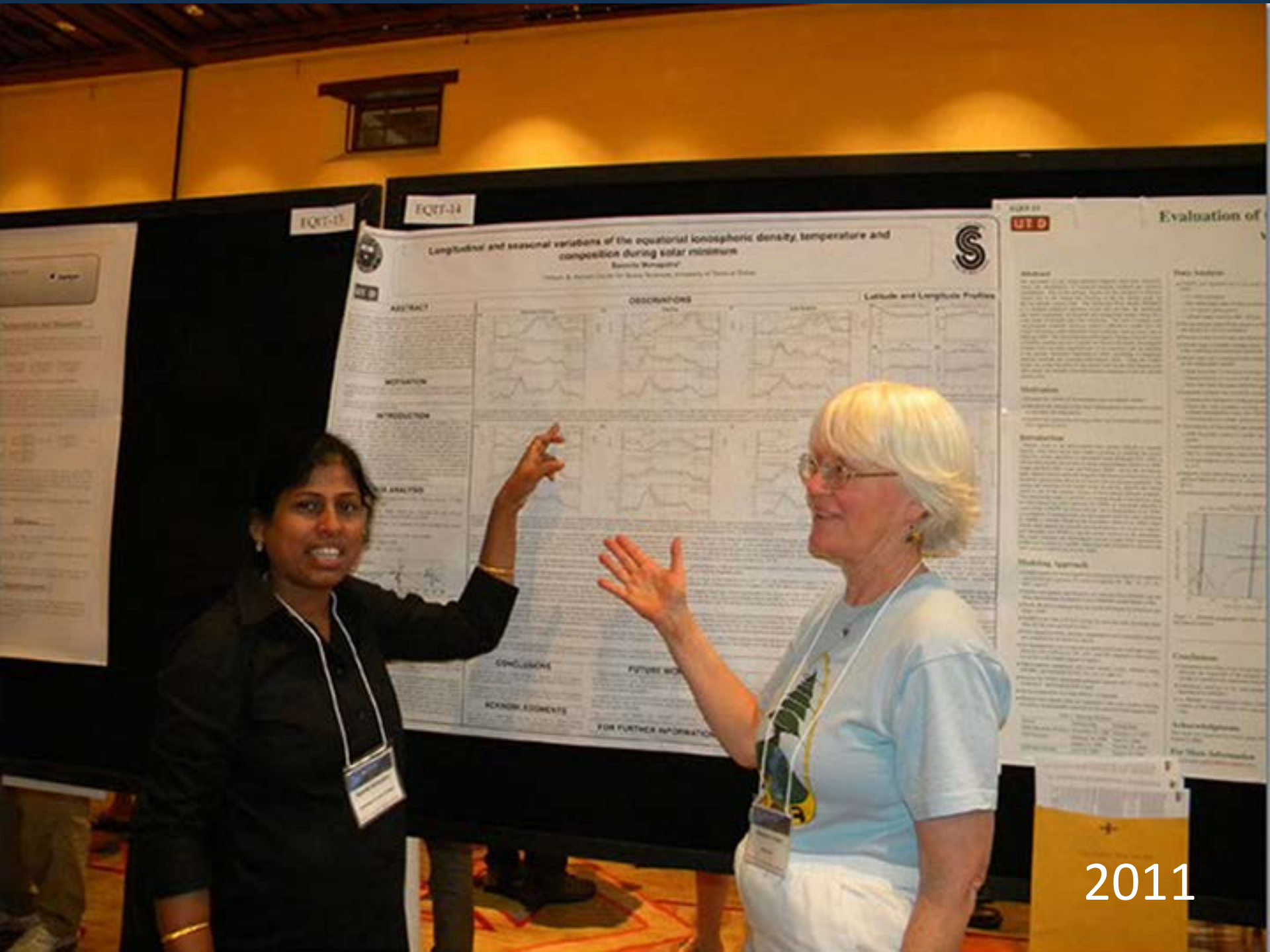
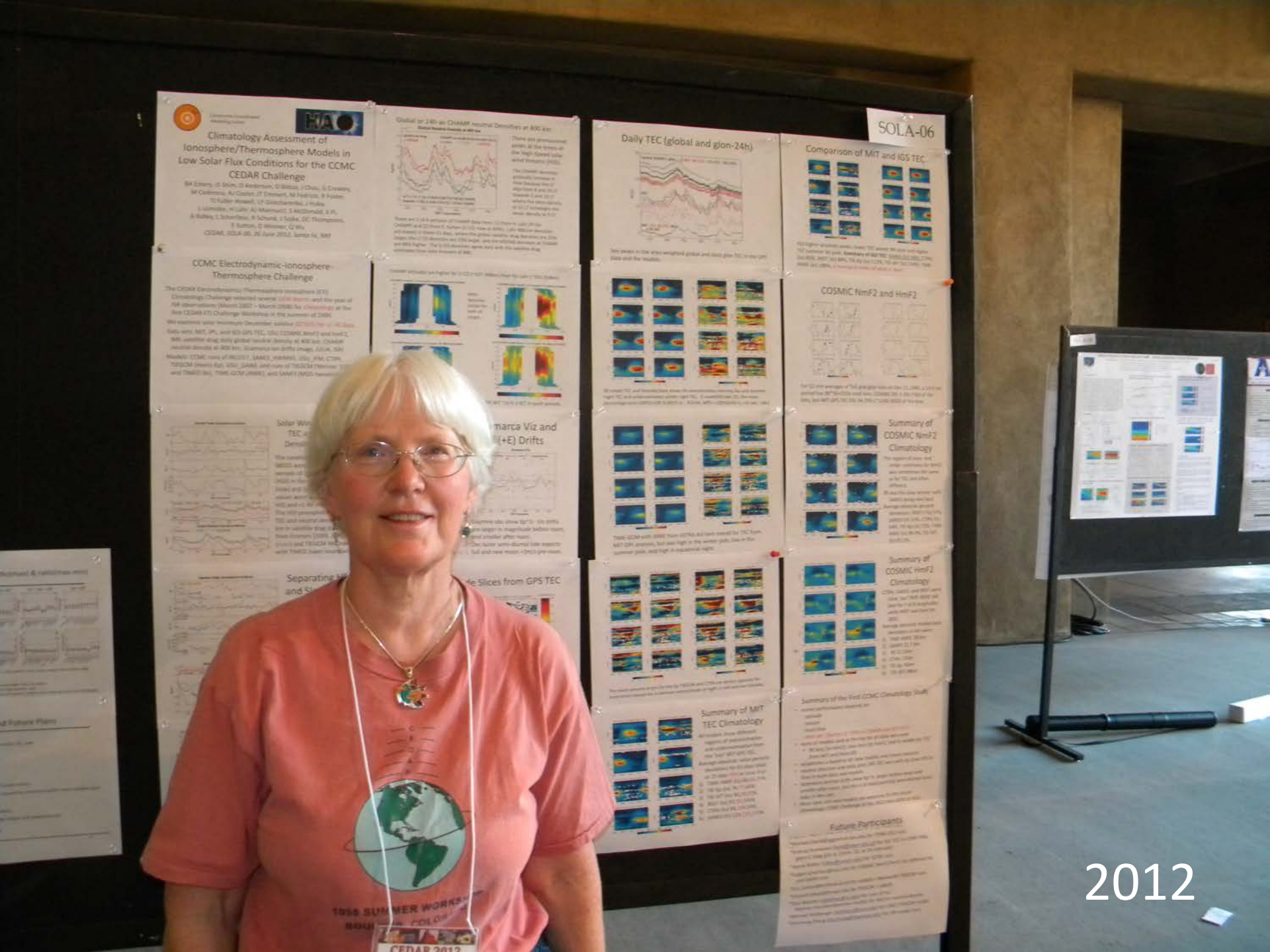

EQT-13
EQT-14
Longitudinal and seasonal variations of the equatorial ionospheric density, temperature and composition during solar minimum
ABSTRACT
OBSERVATIONS
Latitude and Longitude Profiles
MOTIVATION
INTRODUCTION
CONCLUSIONS
ACKNOWLEDGMENTS
FOR FURTHER INFORMATION
UTD
Evaluation of
Abstract
Introduction
Modeling Approach
Conclusions
Acknowledgments
For More Information

2011


2011


CEDAR
2012
SANTA FE
June 24 - June 29
Eldorado Hotel Santa Fe, New Mexico


2012


SOLA-06
Climatology Assessment of Ionosphere/Thermosphere Models in Low Solar Flux Conditions for the CCMC CEDAR Challenge
CCMC Electrodynamic-Ionosphere-Thermosphere Challenge
Daily TEC (global and glon-24h)
Comparison of MIT and IGS TEC
COSMIC NmF2 and HmF2
Summary of COSMIC NmF2 Climatology
Summary of COSMIC HmF2 Climatology
Summary of MIT TEC Climatology
Future Participants
2012


CEDAR
2013
June 22 - June 28
Millenium Hotel - Boulder, Colorado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CEDAR
2014
June 22 - June 26, Seattle
University of Washington


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KENNEDY SPACE CENTE
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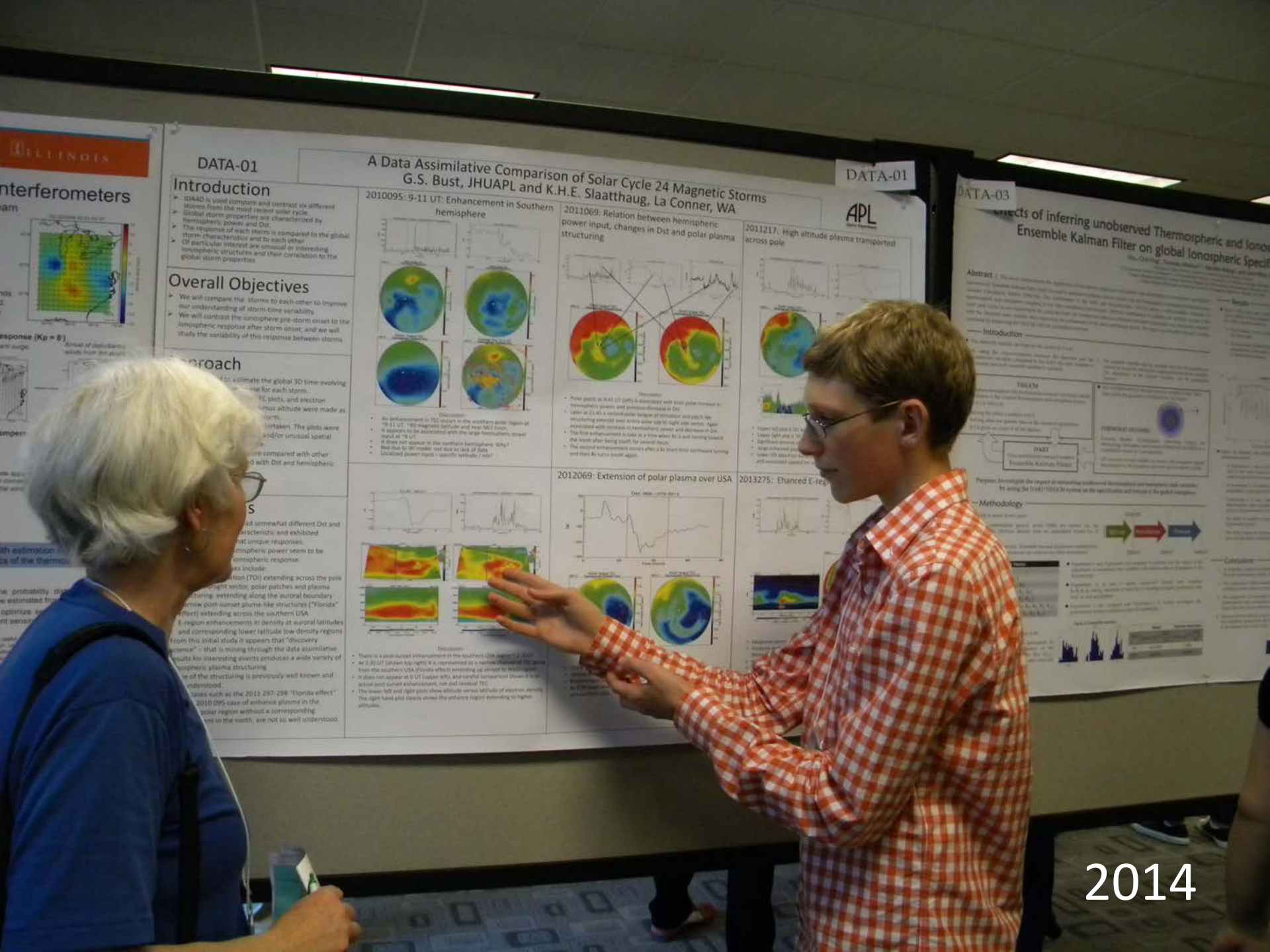
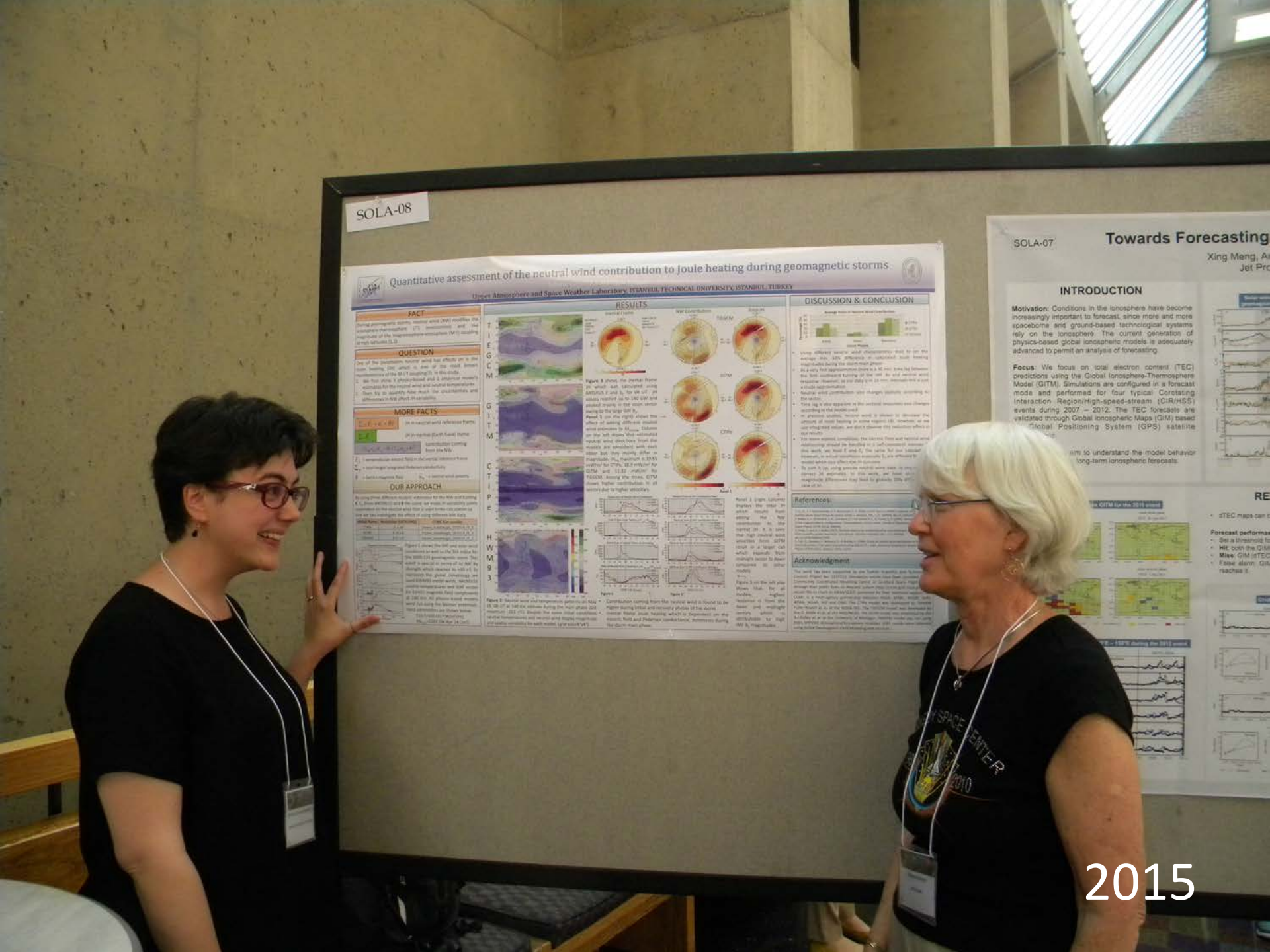

DATA-01
A Data Assimilative Comparison of Solar Cycle 24 Magnetic Storms
G.S. Bust, JHUAPL and K.H.E. Slaatthaug, La Conner, WA
DATA-01
Introduction
Overall Objectives
2010095: 9-11 UT: Enhancement in Southern hemisphere
2011069: Relation between hemispheric power input, changes in Dst and polar plasma structuring
2011217: High altitude plasma transported across pole
2012069: Extension of polar plasma over USA
DATA-03
Ensemble Kalman Filter
Introduction
Methodology

2014


CEDAR
2015
June 21 - June 25, Seattle
University of Washington

2015


SOLA-08
Quantitative assessment of the neutral wind contribution to Joule heating during geomagnetic storms
Upper Atmosphere and Space Weather Laboratory, ISTANBUL TECHNICAL UNIVERSITY, ISTANBUL, TURKEY
FACT
QUESTION
MORE FACTS
OUR APPROACH
RESULTS
TIEGCM
GITM
CTIPe
HWM93
DISCUSSION & CONCLUSION
References
Acknowledgment
SOLA-07
Towards Forecasting
INTRODUCTION
Motivation: Conditions in the ionosphere have become increasingly important to forecast, since more and more spaceborne and ground-based technological systems rely on the ionosphere. The current generation of physics-based global ionospheric models is adequately advanced to permit an analysis of forecasting.
Focus: We focus on total electron content (TEC) predictions using the Global Ionosphere-Thermosphere Model (GITM). Simulations are configured in a forecast mode and performed for four typical Corotating Interaction Region/High-speed-stream (CIR/HSS) events during 2007 – 2012. The TEC forecasts are validated through Global Ionospheric Maps (GIM) based Global Positioning System (GPS) satellite

2015

2015


Jonathan Meiosis, University of Illinois
2015

2015


CEDAR-GEM JOINT WORKSHOP
19 - 24 JUNE 2016 ~ SANTA FE, NEW MEXICO

MLTS-06

MLTS-07

UNIVERSITY OF LOUISVILLE

Long-lasting Mesospheric Inversion Layers in eCMAM30

Christian A. Tate and Jian Du (cdtate01@louisville.edu)
Department of Physics and Astronomy, University of Louisville, Kentucky

Abstract

Mesospheric inversion layers (MILs) are widely studied phenomena that reverse the usual temperature-altitude gradient due in part to planetary wave breaking and/or tides. This investigation uses the extended Canadian Middle Atmosphere Model (eCMAM30) for years 1997-2009 of dynamic and chemical data to explore the temperature and altitude distributions of long-lasting (>3 days) MILs. The temporal and spatial trends of MIL events are synoptically examined. Being the first time eCMAM30 is used to study the distribution of MILs events, this analysis presents an timely opportunity to compare results with other general circulation models. In agreement with WACCM [France et al. 2015] and lidar observations [Guo et al. 2012, Meriwether and Gerrard 2004], the eCMAM30 data-set shows similar trends in low and middle latitudes with the seasonal variability most distinct in the tropics during the equinoxes. The [illegible] of amplitude, thickness, duration and scale are also [illegible] breaking to elucidate the [illegible] high altitude MILs as the they

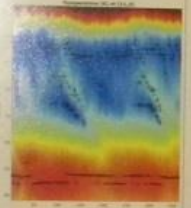
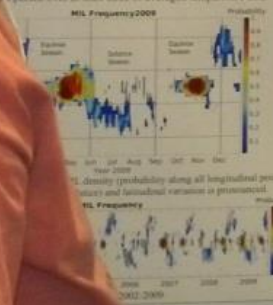


Figure 2. Altitude-Time heat-map of temperature, with mesopause/stratopause (dots) and MIL top/bottom (crosses)

[illegible]ata and Methods of MILs

[illegible] aims to elucidate the statistical trends of long-lasting MIL [illegible]ent in the extended Canadian Middle Atmosphere Model. A [illegible]IL event is a temperature inversion layer that satisfies the [illegible]nditions.

- [illegible]ltitude must be below the mesopause and above the stratopause. [illegible]dots in Figure 2.
- [illegible]L must have a temperature-increasing lapse rate.
- [illegible]L amplitude (temperature inversion) must be greater than 10 K and [illegible]s (altitude scale of the temperature inversion) greater than 4 km [illegible]5]. See crosses in Figure 2 and blue dots in Figure 1.
- [illegible] persist over at least three of averaged temperature data.



Time and Latitudinal Dependence

When MIL events are **longitudinally averaged** (Figures 3, 4 and 5), their distributions show strong seasonal and latitudinal dependences. In Figure 3 the tropical equinoxes (March/September) gradually increase and decrease in MIL density, peaking at 100% for the entire equatorial zone. At a given longitude MIL events can last up to 80 days. The solstices (June/December) show "wings" extending from the tropics into the middle latitudes of the winter hemisphere. Figure 4 shows this pattern consistently throughout the data-set, except when the spring equinox events are diminished every other year— most likely due to the quasi biannual oscillations [Garcia, 1997]. Figure 5(a) and (c) follow similar trends as the MIL density in Figure 3. Figure 5(b), 5(d) and 2 show the downward evolution of MIL events.

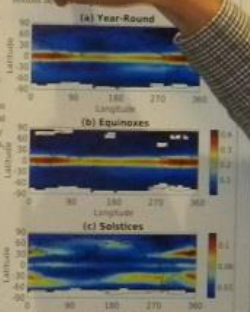


Figure 6. Latitude-longitude map of MIL density (time averaged) for 1997-2009 (a) year-round, (b) equinox and (c) solstice seasons.

The **Time averaged** MIL densities for years 1979-2009 in Figure 6 show strong longitudinal and latitudinal trends. Long-lasting MILs events occur most frequently during the equinox seasons in the tropics, meaning that they are most likely tidally driven. The solstice events, however, primarily occur in the middle latitudes as shown in Figures 3, 4 and 6(c). Note the non-migrating tides in the tropics and middle latitudes. Also note that there are much fewer MIL in the Antarctic, even though the two hemispheres has an equal number of MIL events in total. Figure 10 shows that Arctic MIL events have greater amplitudes and thicknesses— a sign of planetary wave phenomena.

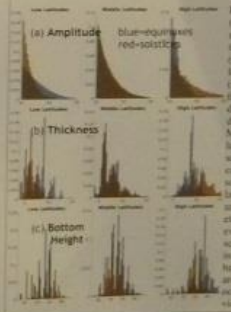


Figure 7. Histograms for MIL (a) amplitude, (b) thickness and (c) bottom height during the (blue) equinox seasons and (red) solstice seasons for (left) low, (center) middle and (right) high latitudes illustrate the seasonal and zonal distributions for MIL events during the years 1979-2009. MIL events in tropics and high latitudes show the most seasonal variance, mirroring each other in all three metrics. solstice amplitudes in the low latitudes resemble the equinox amplitudes in high latitudes, etc. Middle latitude MIL events, however, show little seasonal variance, especially in amplitude and bottom height. MILs in high latitudes are both higher and thicker, occurring mostly in the Arctic, via Figure 10.

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ABSTRACT

In this research we investigate and compare statistical characteristics of the diurnal tides and illustrate how these statistical characteristics change with season, latitude and altitude from the troposphere to thermosphere/ionosphere, using data from the extended Canadian Middle Atmosphere Model (eCMAM30) run (1979-2010) and the Sounding of the Atmosphere using Broadband Emission Radiometry (SABER) instrument on NASA's TIMED (Thermosphere Ionosphere Mesosphere Energetics Dynamics) satellite.

This poster show the comparison of statistical properties (correlations and probability density functions) of short-term and long-term tidal variability of migrating tide (GW1) as a function of time, height, altitude, and latitude between eCMAM30 and SABER. Wavelet analysis is used to analyze localized variations of power within the time series.

Future work involves the development of the statistical amplitude/frequency probability density functions (PDFs) to examine the underlying statistics governing the short-term tidal variability and to what extent these PDFs changes temporally and spatially and apply to the thermodynamic equation to study physical mechanism.

MOTIVATION

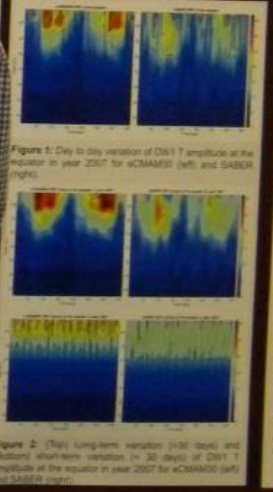

Figure 1: Day to day variation of DW1 T amplitude at the equator in year 2007 for eCMAM30 (left) and SABER (right).

Figure 2: (Top) Long-term variation (>30 days) and (Bottom) short-term variation (< 30 days) of DW1 T amplitude at the equator in year 2007 for eCMAM30 (left) and SABER (right).

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One day data windo

Section B: Spat

Figure 4: Spatial corre long-term variation (c) and short-te variation (d) and short-te

Figure 5: (a & c) Self corre long-term and short-term (b & d) along the correlation plot. lag was cho

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Preserving a Unique Archive for Long-Term Solar Variability Studies
BACKGROUND AND MOTIVATION
2016


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18 - 23 June
Keystone Resort, Colorado