International Symposium on the Whole Atmosphere (ISWA)

Date : 14-16 September 2016
Venue: Ito Hall, The University of Tokyo, Tokyo, Japan

Program

Keynote talks: 30min; Invited talks: 15min; Contributed talks: 15min

Wednesday, September 14

10:30-10:40 Opening remarks (K. Sato)

10:40-12:10 Oral presentations

Keynote 1 (10:40-11:10)
K. Hamilton: Propagation of the S2 tide throughout the whole atmosphere: The remarkable information in a simple barometric record

Session 1: Planetary/Rossby waves and tides I

J. M. Forbes: Planetary wave-tide interactions and consequences in the middle and upper atmosphere (invited)
J. Oberheide: Short-term tidal variability in the ionospheric dynamo region over one solar cycle (invited)
R. R. Garcia: Seasonal and interannual variability of the diurnal tides observed by SABER (invited)
L. Chang: Coherent seasonal, annual, and quasi-biennial variations in ionospheric tidal/SPW amplitudes: Observations and Modeling

12:10-13:30 Lunch

13:30-15:15 Oral presentations

Session 2: Planetary/Rossby waves and tides II

R. S. Lieberman: Observational and theoretical studies of tide-planetary wave interaction in the middle atmosphere (invited)
A. K. Smith: The QBO impacts on tides and the SAO (invited)
V. Wirth: Diagnosing long-range propagation of upper tropospheric Rossby wave packets (invited)

Session 3: Middle atmosphere climate

D. R. Marsh: Are stratospheric ozone chemistry feedbacks critical for the determination of climate sensitivity? (invited)
K. Matthes: Decadal variability and its relation to the solar cycle and internal variability (invited)
B. Funke: Mesosphere-stratosphere coupling by polar winter descent of odd nitrogen (invited)
Y. Tomikawa: Dynamical response of the SH middle atmosphere to energetic particle precipitations in the latest reanalysis data

15:15-15:45 Coffee break

15:45-17:45 Oral presentations

Session 4: Sudden stratospheric warming and SSW-initiated global coupling

R. A. Vincent: Sudden stratospheric warmings in the southern hemisphere and coupling to the mesosphere (invited)
T. Birner: Sudden stratospheric warmings and anomalous upward wave activity flux (invited)
T. Hirooka: Modulation of the semiannual oscillation induced by sudden stratospheric warming events (invited)
Y. J. Orsolini: Role of planetary waves, gravity waves and tides in the downward transport of nitrogen oxides during elevated stratopause events
S. Noguchi: Predictability of the stratospheric polar vortex breakdown: An ensemble reforecast experiment for the splitting event in January 2009
C. Zülicke: Relation of low-latitude mesospheric wind anomalies to SAO, QBO and SSW
F. I. Laskar: Interhemispheric coupling during sudden stratospheric warmings and at different phases of Quasi-Biennial Oscillation
K. Sato: Interhemispheric Coupling Study by Observations and Modelling (ICSOM)

ICSOM meeting (members only) (18:00-19:30)

Thursday, September 15

9:30-10:45 Oral presentations
Keynote 2 (9:30-10:00)

W. Randel: Satellite observations and coupling of the whole atmosphere

Session 5: Stratosphere-troposphere coupling I

M. A. Geller: Baroclinic mixing of potential vorticity as the principal sharpening mechanism for the tropopause inversion layer (invited)
M. H. Hitchman: On the role of inertial instability in cyclones: Stratosphere-troposphere exchange, jet acceleration, and PV dipoles (invited)
P. H. Haynes: The controlling effect of the stratosphere on the tropospheric flow and on upward planetary wave propagation (invited)

10:45-11:00 Coffee break

11:00-12:15 Oral presentations

Session 6: Stratosphere-troposphere coupling II

T. Iwasaki: Impacts of low-level polar cold air outbreaks on Brewer-Dobson circulations (invited)
S.-W. Son: Modulation of the organized tropical deep convections by the stratospheric Quasi-Biennial Oscillation (invited)
S. Yoden: Stratosphere-troposphere dynamical coupling in the tropics: QBO modulations of the tropical deep convection and the MJO (invited)
M. P. Baldwin: tbd (invited)
M. Abalos: Phase-speed spectra of tracer eddy fluxes linked to isentropic stirring in the UTLS

12:15-13:30 Lunch

13:30-15:30 Poster presentations

15:30-16:00 Coffee break

16:00-18:00 Oral presentations

Session 7: Gravity waves I

H.-Y. Chun: Convective gravity waves and their interaction with QBO (invited)
S. L. Vadas: The vertical coupling of the lower to upper atmosphere via atmospheric gravity waves (invited)
A. Hertzog: Gravity waves: Long-duration balloon observations and parameterization in climate models (invited)
P. Preusse: Global gravity wave distributions from limb-sounding satellites, ECMWF and ray-tracing modelling (invited)
I. Krisch: 3D tomographic measurements of gravity waves with the IR limb imager GLORIA during GW-LCYCLE
D. J. Murphy: Gravity waves in models and observations over Antarctica and the Southern Ocean (invited)
R. Shibuya: Inertia-gravity waves with a wave period of quasi-12 h in the mesosphere observed by the PANSY radar
B. R. Sutherland: Flows induced by 1D, 2D and 3D internal wavepackets (invited)

19:00-21:00 Banquet (Registration and payment are necessary by August 15 2016)

Friday, September 16

9:30-10:45 Oral presentations

Keynote 3 (9:30-10:00)

W. E. Ward: Effects of dynamical variability in the mesosphere and lower thermosphere on energetics and constituents

Session 8: Vertical coupling I

Huixin Liu: Thermospheric inter-annual variability: Implications for effects of ENSO and QBO (invited)
K. Shiokawa: Horizontal and vertical coupling of the middle and upper atmosphere observed by airglow imagers (invited)
J. Yue: Quasi-two-day wave coupling of the middle atmosphere and ionosphere-thermosphere (invited)

10:45-11:00 Coffee break

11:00-12:15 Oral presentations

Session 9: Vertical coupling II

X. Chu: Thermospheric Fe layers up to ~200 km in Antarctica and their coupling with the atmosphere, ionosphere and magnetosphere (invited)
Y. Miyoshi: Vertical propagation of gravity waves in the thermosphere simulated by GAIA (invited)
H. Schmidt: What determines the downward transport of nitrogen oxides from the lower thermosphere to the stratosphere? (invited)
R. Yasui: An analysis on the momentum budget in the MLT region based on satellite and whole atmosphere model data
A. de la Camara: The impact of source-related nonorographic gravity wave parameterizations on the circulation of the middle atmosphere
12:15-13:30 Lunch

13:30-15:30 Oral presentations

Session 10: Observations and technology of the middle and upper atmosphere

- I. M. Reid: Meteor radar and airglow observations at middle and high latitudes (invited)
- M. Yamamoto: Study of ionospheric irregularities over Japan and Indonesia with radars and other instruments (invited)
- J. L. Chau: MMARIA: A multi-static, multi-frequency meteor radar approach to improve the MLT wind field measurements (invited)
- M. Tsutsumi: Characteristics of mesosphere echoes over Antarctica obtained using PANSY and MF radars
- K. Nishimura: Technical development for MST radar; Pulse coding, signal processing and spectrum estimation

Session 11: Gravity waves II

- M. Rapp: Initial results of the GW-LCYCLE campaign 2015/16 - results on the life cycle of gravity waves from combined airborne and ground based observations (invited)
- T. Moffat-Griffin: Measuring mesospheric gravity waves from above the oceans: a ship-borne imager
- X. Lu: Statistical characterization of high-to-medium frequency gravity waves in vertical winds and temperatures in the MLT

15:30-16:00 Coffee break

16:00-17:45 Oral presentations

Session 12: Gravity waves III

- D. C. Fritts: tbd (invited)
- T. Nakamura: Gravity waves in the middle atmosphere over Syowa Station, the Antarctic (69S, 40E), observed with ground-based optical observations
- I.-S. Song: Numerical simulation of mesoscale gravity waves observed near the mesopause region

Session 13: High-resolution GCM

- M. J. Alexander: Gravity waves and precipitation in high-resolution models and observations (invited)
- E. Manzini: Towards a high resolution stratosphere in ICON (invited)
- E. Becker: Explicit simulation of gravity waves up to the lower thermosphere using a global circulation model (invited)
- Hanli Liu: Gravity Wave Variation from the Stratosphere to the Lower Thermosphere During Stratospheric Sudden Warming Events (invited)

17:45-17:50 Closing remarks (K. Sato)

Saturday, September 17

Excursion (Registration and payment are necessary by August 15)

List of poster presentations (Thursday, September 15)

Planetary/Rossby waves and tides

- X. Lu: Vertical coupling of eastward travelling planetary waves from the stratosphere to the lower thermosphere in Antarctica using lidar, satellite, and modeling
- S. Eswaraiah: Observation of strong mesospheric tides over the Antarctic during stratosphere sudden warming years
- S. Nozawa: Changes of temperature and semidiurnal tide in the polar lower thermosphere and upper mesosphere related to sudden stratospheric warmings above Tromsoe, Norway
- M. A. Thithonis: Quasi two day wave activity during major sudden stratospheric warming events
- V. Silverman: Radiative effects of ozone waves on the polar vortex seasonal cycle and extratropical QBO signal
- R. Thiéblemont: Poleward transport variability in the northern hemisphere during the final stratospheric warming simulated by CESM (WACCM)

Middle atmosphere climate

- A. Kuchar: A mid-latitude stratosphere dynamical index for attribution of stratospheric variability and improved ozone and temperature trend analysis - dynamics discussion
- H. Naoe: Future changes in ozone Quasi-Biennial Oscillation with increasing GHGs and ozone recovery in CCMI simulation
- D. F. Hurst: Stratospheric water vapor and ozone: Past influences on climate evaluated using the SWOOSH database
- M. Lopez-Puertas: Variability of temperature and cooling rates in the mesosphere and lower thermosphere

Sudden stratospheric warming and SSW-initiated global coupling

- A. de la Camara: On the sensitivity of sudden stratospheric warmings to previous stratospheric conditions
- V. Kumar: Impact of sudden stratospheric warming (SSW) over tropical region: A study using COSMIC/ FORMOSAT-3 observations
- P. Kishore: Sudden stratospheric warmings observed in the last decade by satellite measurements
**Stratosphere-troposphere coupling**

- M. Sandhya: Convective response due to a potential vorticity intrusion in tropical latitudes
- M. Sandhya: Tropical upper tropospheric humidity variations and tropical plumes due to potential vorticity intrusions over Indian sector
- S. K. Sharma: Investigations on water vapor, total column ozone and aerosol optical thickness over western sites of India
- D. Domeisen: A blocking view of stratosphere - troposphere coupling
- E. Nishimoto: Influence of the stratospheric Quasi-Biennial Oscillation on the Madden-Julian Oscillation during austral summer
- T. Yamanouchi: Importance of stratosphere-troposphere coupling in polar atmosphere and climate
- T. Ernakova: Manifestation of ENSO events in the extra-tropical stratosphere
- E. Savenkova: Stratosphere-troposphere coupling during the SSW Events
- J. Suzuki: Internannual variability of equatorial Kelvin waves around the tropical tropopause influenced by the background wind
- S. Hirano: A three-dimensional analysis on the role of atmospheric waves in the climatology and interannual variability of stratospheric final warming in the Southern Hemisphere
- K. Nishii: Decay processes of short and long extreme stratospheric polar vortex events

**Gravity waves**

- J. B. Snively: Numerical modeling of large amplitude mesospheric gravity waves and their observable signatures in the hydroxyl airglow layer
- B.-G. Song: Sources of gravity waves in the upper mesosphere at King Sejong Station, Antarctica (62.22°S, 58.78°W)
- P. Ghosh: Convection generated high frequency gravity waves: Comparison between MST radar observations & WRF simulation
- M. Pramitha: Identification of gravity wave sources over tropical latitudes using reverse ray tracing technique
- M. Kogure: Seasonal and height variations of gravity wave activities in the middle atmosphere (15-70 km) over Syowa Station (69S, 40E) in the Antarctic using Rayleigh/Raman lidar
- Y. Minamihara: Characteristics of vertical wind fluctuations in the lower troposphere at Syowa Station in the Antarctic revealed by the PANSY radar
- D. Takeo: Long-term variation of horizontal phase velocity spectra of atmospheric gravity waves observed by an airglow imager at Shigaraki: Comparison between mesopause region and thermosphere
- S. Perwitasari: 3-years of concentric gravity wave activities in the middle atmosphere (15-70 km) over Syowa Station in the Antarctic
- A. V. Koval: Numerical simulation of the stationary orographic gravity waves impact on the ozone fluxes and meridional circulation during stratospheric warming events in the middle atmosphere
- J. Zhao: Characterization of gravity waves in the stratosphere and lower mesosphere at McMurdo, Antarctica
- C. Chen: Lidar observations and automated extraction of persistent gravity waves with periods of 3-10 h at McMurdo (77.83°S, 166.67°E) utilizing two-dimensional Morlet wavelet transform
- T. S. Matsuda: New applications of horizontal phase velocity spectrum derived from airglow imaging observation at Syowa
- C. J. Heale: Interaction of finite amplitude gravity waves in the mesosphere and lower thermosphere

**Vertical coupling**

- M. Shivankandan: Multi-instrument investigation of troposphere-ionosphere coupling through gravity waves and the role of gravity waves in the formation of equatorial plasma bubbles (EPBs)
- A. Saito: ISS-IMAP observation of the airglow structures in the MLT region
- L. N. Makarova: Influence of the space disturbances on the Arctic weather
- N. Eguchi: Sudden tropical stratospheric warming by subtropical jet variation in the middle atmosphere
- V. Matthias: QBO modulation of the southern polar mesopause region
- G. Bharti: Radiative cooling by NO emission observed by TIMED/SABER over Asian sector

**Observations and technology of the middle and upper atmosphere**

- M. K. Ejiri: Observed fine-structures in sporadic Ca+ ion layers by a frequency-tunable resonance scattering lidar in the midlatitude
- P. Baron: Study for measuring middle and upper atmospheric wind and temperature with sub-millimeter and TeraHertz limb sounders
- J. Gumbel: The MATS satellite mission - tomography of structures and waves in the upper mesosphere and lower thermosphere
- Y. Guo: Measuring turbulence and eddy flux with a Na lidar
- H. Hashiguchi: Development of MU radar real-time processing system with adaptive clutter rejection
- S. Ochiai: A plan of submillimeter limb sounder for measurement of the middle atmosphere

**Wave-mean flow interaction**

- Y. Hayashi: Formation of two dimensional and three dimensional circulation responding to unsteady wave forcing in the middle atmosphere
- T. Kinoshita: A study of three dimensional structure of stratospheric material transport
- Y. Kanno: Mean meridional circulations expressed by mass-weighted isentropic time means

**Solar effects on the neutral atmosphere**

- K. Kodera: Solar influence on the tropical troposphere from the middle atmosphere
- K. Imai: SMILES observations of mesospheric ozone during the solar eclipse
- T. Nishiyama: Comparison study between polar mesosphere winter echo, CNA and electron density in the mesosphere based on the PANSY radar

Last update: July 11, 2016