

## S-RIP Chapter on Stratosphere-Troposphere Coupling: Tentative Author Contributions

### Coupling on Synoptic to Intraseasonal Time Scales

SSWs, blocking, annular modes, planetary wave coupling

Mark Baldwin Thomas Birner	Mechanisms of S-T coupling Mechanisms of S-T coupling involving eddy feedbacks	daily data of stratospheric vortex variability (e.g. based on PV), various eddy fluxes throughout the column, tropopause parameters, surface pressure	Thompson et al. (2006), Song and Robinson (2004), Thompson and Birner (2012), Baldwin and Birner (2013)
Amy Butler	SSWs (definitions, and impact on stratosphere-troposphere coupling)	Zonal mean zonal wind at 10mb; temperature anomalies at 10mb; polar cap geopotential height anomalies (perhaps at several vertical levels from the stratosphere to the surface).	Baldwin and Dunkerton 2001; Charlton and Polvani 2007; Butler et al. (in prep)
Edwin Gerber	Time scales and downward coupling of the Annular Modes	Annular Mode indices, based on daily zonal mean geopotential height	Baldwin and Dunkerton 1999, Baldwin et al. 2003, Gerber et al. 2010.
Lesley Gray Steven Hardiman	SSW diagnostics - joint with Dann Mitchell Final Warming Events	see below Time of SH final warming at 10hPa (based on zonal mean, monthly mean, U) and/or NH final warming TYPE (ratio of 10hPa_first vs 1hPa_first) or time (at 10hPa...?)	Butchart et al., 2011, Hardiman et al., 2011
Peter Hitchcock	Variability of the polar vortices, inter-comparison of indices and event definitions	Abacus plots (EOFs of polar-cap averaged temperatures), other indices/event definitions being considered in the chapter	Hitchcock, Shepherd and Manney 2013
Kristin Krueger Patrick Martineau	SSWs ... wind tendencies during SSW events, climatology of planetary winds		
Daniel Mitchell	Mean state and variability of the polar vortices. SSWs (splits and displacements), and corresponding definitions. Stratospheric climate change and surface teleconnections. Surface volcanic and solar effects (via the stratospheric pathway)	For SSW definitions; ZMWZ at 60N and 10hPa, moment diagnostics, NAM threshold. For climate change; regression based techniques (detection and attribution). For surface effects; NAO and surface temperature.	Mitchell et al, 2011. Mitchell et al, 2013a,b. Frame and Gray, 2010. Driscoll et al, 2012.
Thomas Reichler	Annular mode diagnostics (time scales, downward coupling; w/ Ed + Mark?), wave-mean flow diagnostics	Annular modes indices, Paul Newman's 100 hPa heat flux / 50 hPa temperature analysis. EP-flux climatologies	Limpasuvan et al. (2004), Newman et al. (2001)
Yulia Zyulyaeva	three dimensional wave-mean flow diagnostics		

### **Coupling on Intraseasonal to Interannual Time Scales**

impact of Volcanoes, ENSO, QBO (to be coordinated w/QBO chpt), and Solar Cycle on stratosphere-troposphere coupling

Natalia Calvo	ENSO signal in the stratosphere	Signals in monthly-mean temperature and zonal wind in the high latitudes of the stratosphere, downward propagation of the signals back to the troposphere.	Garcia-Herrera et al. (2006), Manzini et al. (2006), Cagnazzo and Manzini (2006)
Lesley Gray	solar connections, including interactions with volcanic, ENSO and QBO influences	multi-linear regression where we included solar, volcanic, ENSO, trend and QBO	Crooks and Gray (2005), Frame and Gray (2009)
Alexey Karpechko	circulation response to volcanic eruptions	temperature and zonal wind responses	Karpechko et al. 2010, QJRMS, Charlton-Perez et al. 2013
Hua Lu	diagnostics of planetary wave propagation and/or multiple solar effect on stratosphere-troposphere coupling	1) daily, monthly and seasonal averaged EP-flux and divergence; 2) solar UV and geomagnetic effect on downward propagation of stratospheric perturbations	Lu et al. 2013, Seppala et al. 2013, Cnossen et al. 2011, Lu et al. 2009
Cristina Pena-Ortiz	QBO signature in the extratropical stratosphere. Tropospheric impacts of the QBO in tropics and extratropics.		
Masakazu Taguchi	Global S-T response to ENSO (and QBO)	Monthly and daily means of zonal mean T and U, and EP flux, etc.	Manzini et al. (2006), Ineson and Scaife (2009), Garfinkel and Hartmann (2007), Wei et al. (2007), Calvo et al. (2009)
Seok-Woo Son	QBO-related tropospheric circulation anomalies		Ho et al. (2009) GRL

### **Coupling on Interdecadal Time Scales and Longer**

coupling to MOC(?), impact of stratospheric ozone loss and other forcings on tropospheric trends

Tom Bracegirdle	Recent Southern Hemisphere climate change associated with the Antarctic ozone hole	Trends in temperature, geopotential height and EP flux in high-latitude Southern Hemisphere	Thompson and Solomon (2002), Randel and Wu (1999), Orr et al. 2012
Alexey Karpechko	Strat-trop coupling associated with ozone trends		Karpechko et al. 2010
Andrew Orr	Recent Southern Hemisphere climate change associated with the Antarctic ozone hole	Trends in temperature, geopotential height and EP flux in high-latitude Southern Hemisphere	Thompson and Solomon (2002), Randel and Wu (1999), Orr et al. 2012
Thomas Reichler	interannual variability of ozone - vortex temperature relationships [provided this fits in this chapter]		
Seok-Woo Son	SH O3-related tropospheric variability		