METEOROLOGY OF SO CLOUD REGIMES

WORKSHOP ON SOUTHERN OCEAN CLOUDS & AND METEOROLOGY

Shannon Mason

Monash Weather and Climate

Nov 27 2012
Introduction

Characterising the meteorological context of the ISCCP cloud regimes.

- Looking at DJF: this is when TOA shortwave flux biases are greatest
- DJF is also best for ISCCP observations
- ERA-Interim data
**Meteorology of SO Cloud Regimes**

S. Mason

**Introduction**

Cloud regimes

Regime meteorology

- Vertical pressure velocity
- Potential temperature
- Relative humidity
- Wind speed and direction
- Temperature advection

**Identifying case studies**

**Future work**

---

**ISCCP histograms**

Sorted lowest to highest, thinnest to thickest:

- **S1–S3:** boundary layer clouds
- **S4 & S5:** mid-topped clouds
- **S6 & S7:** deep clouds
- **S8:** cirrus
Selected regimes:

- **S1**: prevalent marine BL clouds,
- **S4 & S5**: high latitudes, associated with TOA SW flux bias
- **S6 & S7**: fronts and extratropical cyclones
MEETEOLOGY
OF SO CLOUD
REGIMES
S. Mason

Introduction

Cloud regimes

2 Regime meteorology

Vertical pressure velocity
Potential temperature
Relative humidity
Wind speed and direction
Temperature advection

3 Identifying case studies

4 Future work
**Meteorology of SO Cloud Regimes**

S. Mason

**Introduction**

Cloud regimes

**Regime meteorology**

- Vertical pressure velocity
- Potential temperature
- Relative humidity
- Wind speed and direction
- Temperature advection

**Identifying case studies**

**Future work**

![Vertical velocity profiles (DJF)](image)
Meteorology of SO Cloud Regimes

S. Mason

Introduction

Cloud regimes

Regime meteorology

Vertical pressure velocity

Potential temperature

Relative humidity

Wind speed and direction

Temperature advection

Identifying case studies

Future work

Potential temperature profiles (DJF)
METEOROLOGY OF SO CLOUD REGIMES
S. Mason

Introduction
Cloud regimes

Regime meteorology
Vertical pressure velocity
Potential temperature
Relative humidity
Wind speed and direction
Temperature advection

Identifying case studies

Future work

Relative humidity profiles (DJF)
Introduction
Cloud regimes

Regime meteorology
Vertical pressure velocity
Potential temperature
Relative humidity
Wind speed and direction
Temperature advection

Identifying case studies

Future work
Wind direction profiles (DJF)

- Mean Wind direction (m s**-1)
- Dir anomaly (m s**-1)

### Introduction
Cloud regimes

### Regime meteorology
- Vertical pressure velocity
- Potential temperature
- Relative humidity
- Wind speed and direction
- Temperature advection

### Identifying case studies

### Future work
Meteorology of SO Cloud Regimes

S. Mason

Introduction

Cloud regimes

Regime meteorology

Vertical pressure velocity
Potential temperature
Relative humidity
Wind speed and direction
Temperature advection

Identifying case studies

Future work
Meteoroology of SO Cloud Regimes

S. Mason

Introduction

Cloud regimes

Regime meteorology

Vertical pressure velocity
Potential temperature
Relative humidity
Wind speed and direction
Temperature advection

Identifying case studies

Future work
Meteorology of SO Cloud Regimes

S. Mason

Introduction

Cloud regimes

Regime meteorology

Vertical pressure velocity
Potential temperature
Relative humidity
Wind speed and direction
Temperature advection

Identifying case studies

Future work

Organisation

10 December 2000

15 December 2000

20 December 2000

25 December 2000
Meteorology of SO cloud regimes

S. Mason

Introduction

Cloud regimes

Regime meteorology

Vertical pressure velocity
Potential temperature
Relative humidity
Wind speed and direction
Temperature advection

Identifying case studies

Future work
Future work

- Case studies
- Organisation around extratropical cyclones
- Microphysics