Proposed Outline for an AMS Monograph

**The Atmospheric Radiation Measurement Program: First 20 Years**

Editors: David Turner, Thomas Ackerman, Bob Ellingson

The objectives of the monograph are

1. Summarize the scientific contributions of ARM (1990-2009)
2. Describe the scientific evolution of ARM
3. Provide a programmatic history

Short contributions, which are marked with “(S)”, should be 3,000-5,000 words, the other contributions should be in the 5,000-7,000 word range.

**Introduction** – Ackerman (S)

*Section I*: The evolving ARM concept

A historical view of the program focusing primarily on the evolution of broad scientific questions and programmatic developments

1. **Prelude** – Ellingson (S)
2. **Original ARM Concept and Launch** – Stokes (S)
3. **Maturing of ARM** – Ackerman (S)
4. **Current configuration** – Mather, Turner (S)

*Section 2*: The sites and supporting infrastructure

Descriptions of the sites and their scientific roles, and sub

1. **Introduction: Deploying ARM** – Sisterson (S)
2. **SGP** – Lamb
3. **TWP** – Long
4. **NSA** – Verlinde
5. **Mobile facility** – Miller (S)
6. **UAV and aircraft measurements** – Schmid (S)
7. **The data system and archive** – McCord
8. **Data quality program** – Peppler (S)

*Section 3:*Scientific contributions of ARM

*Section 3.1* Radiative transfer instrumentation and theory

1. **Measuring water vapor** – Turner
2. **Infrared spectroscopy** – Mlawer
3. **RT model improvements in GCMs** – Mlawer
4. **Broad-band radiometry** – Michalsky

*Section 3.2* Cloud properties and processes

1. **Development and applications of the millimeter cloud radar** – Kollias and Clothiaux
2. **Cloud property retrievals (active, passive, and active-passive)** – Mace and Shupe
3. **Fluxes and heating rates** – McFarlane
4. **Cloud resolving modeling: the GCSS story and beyond** – Krueger and Randall

*Section 3.3* Surface and aerosol properties

1. **Surface properties and interactions** – Berg, Lamb
2. **Physical and optical properties, and processes** – McComiskey
3. **Indirect effects** – Feingold
4. **Aerosols in climate and climate models** – Ghan

*Section 3.4* Extended impacts of ARM

1. **The SCM concept and creation of forcing datasets** – Zhang and Somerville
2. **Impact on climate modeling** – Randall and Del Genio
3. **Impact on NWP** – TBD
4. **Role in satellite validation** – Marchand and Minnis
5. **CloudNet and other European initiatives** – Haeffelin

**Summary: Accomplishments and broader implications** – Editors (S)