Concentrated Solar Drying

Design and Testing Team

Spring 2010 Student Team
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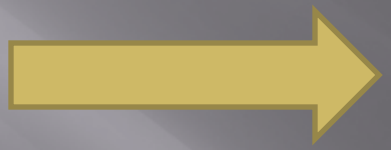

Prototype Design and Initial Testing

Summer 2010 Student Team
Simon Li
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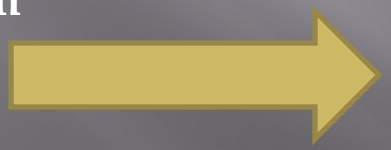


Instrumentation Setup and Testing

Fall 2010 Student Team
James Stiling

Testing and Design Modification

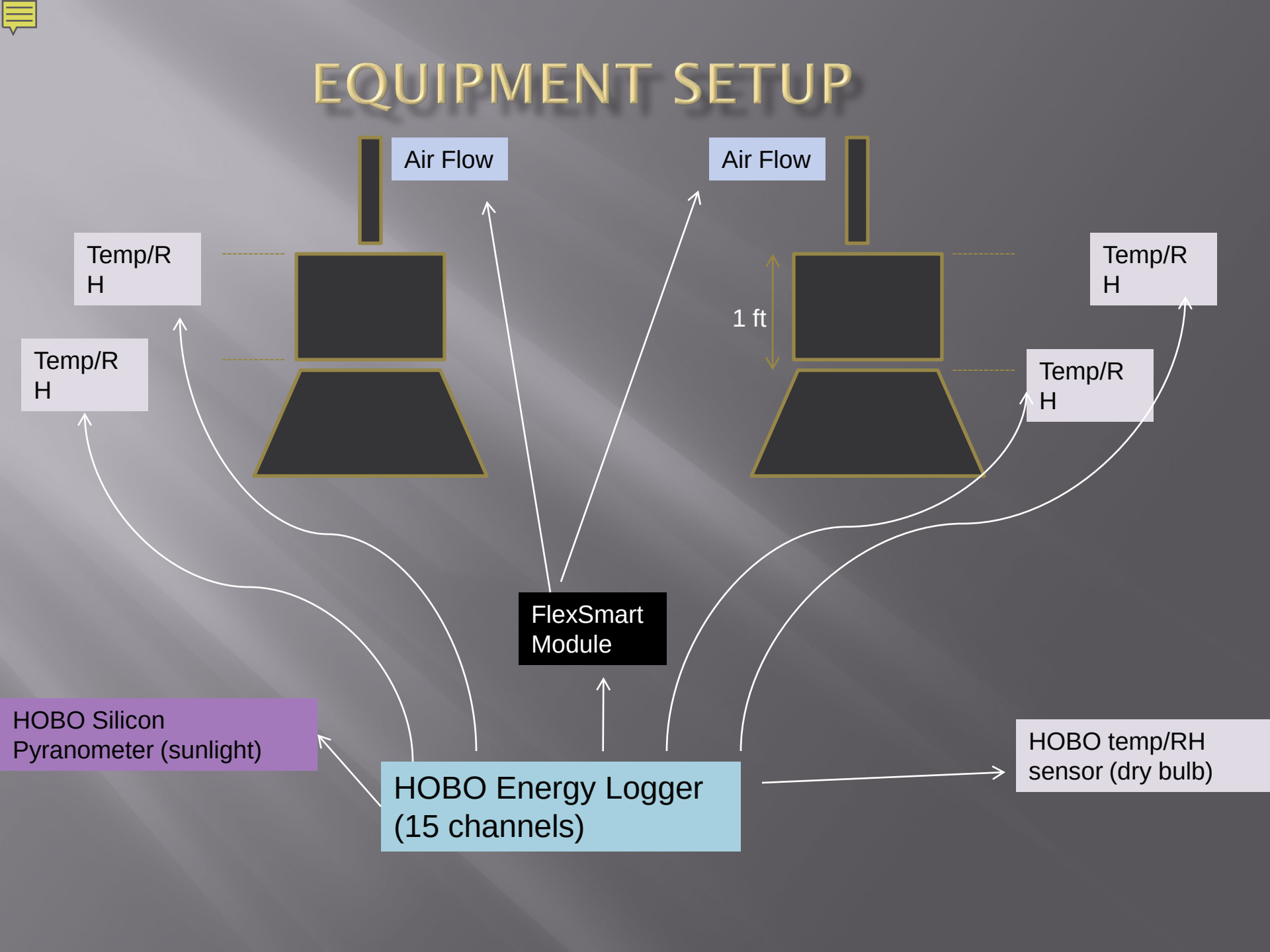
Problem Definition

- Significant post harvest loss in hazy and tropical Environments
- Between harvest periods, high price and low availability of produce
- An inexpensive solution is inaccessible in many developing countries

CONCENTRATED SOLAR DRYING

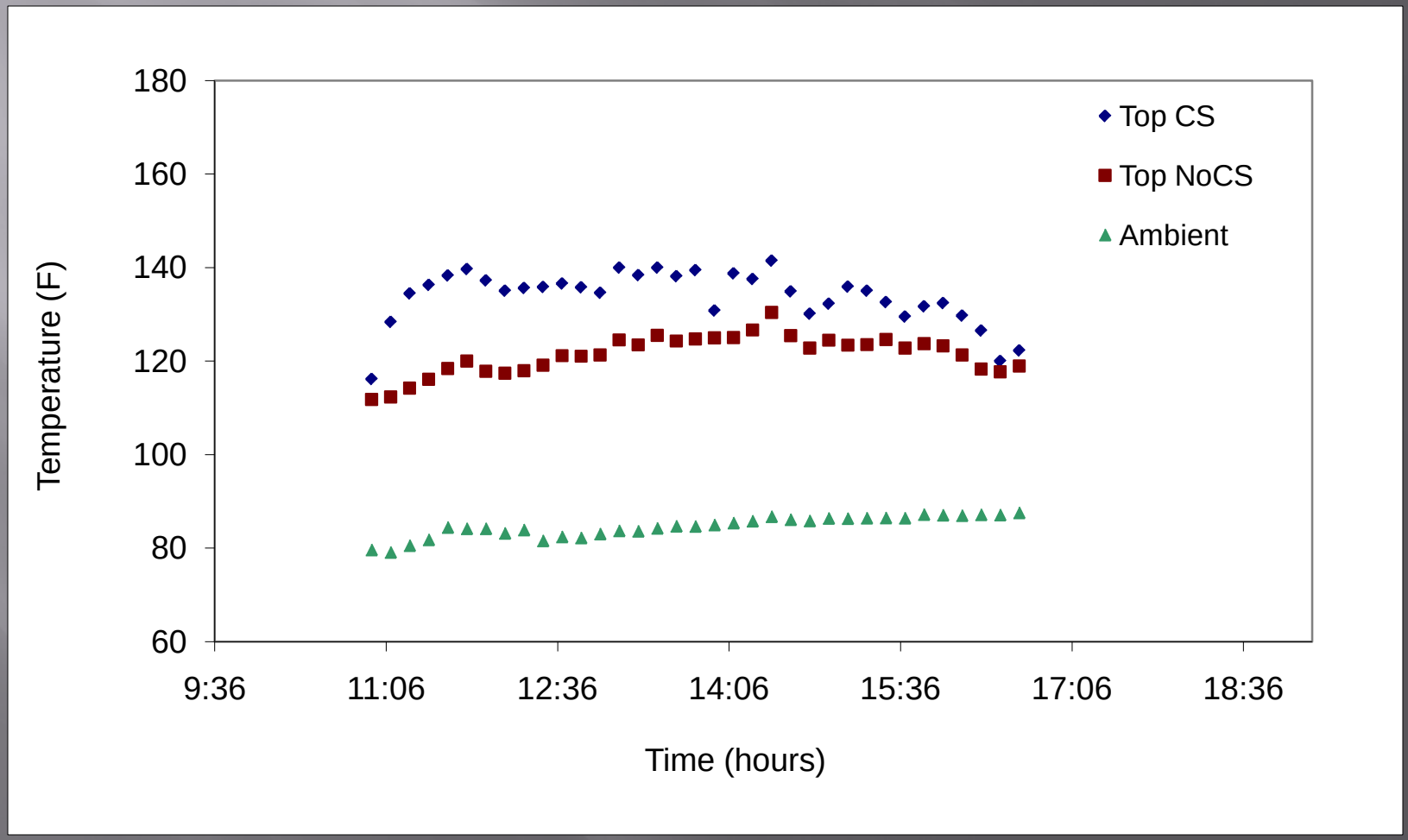

UV resistant Polyethylene Sheeting
Black Absorber/Emitter
Adjustable Insolation Reflectors
Trays
Inlet/Outlet

EQUIPMENT SETUP



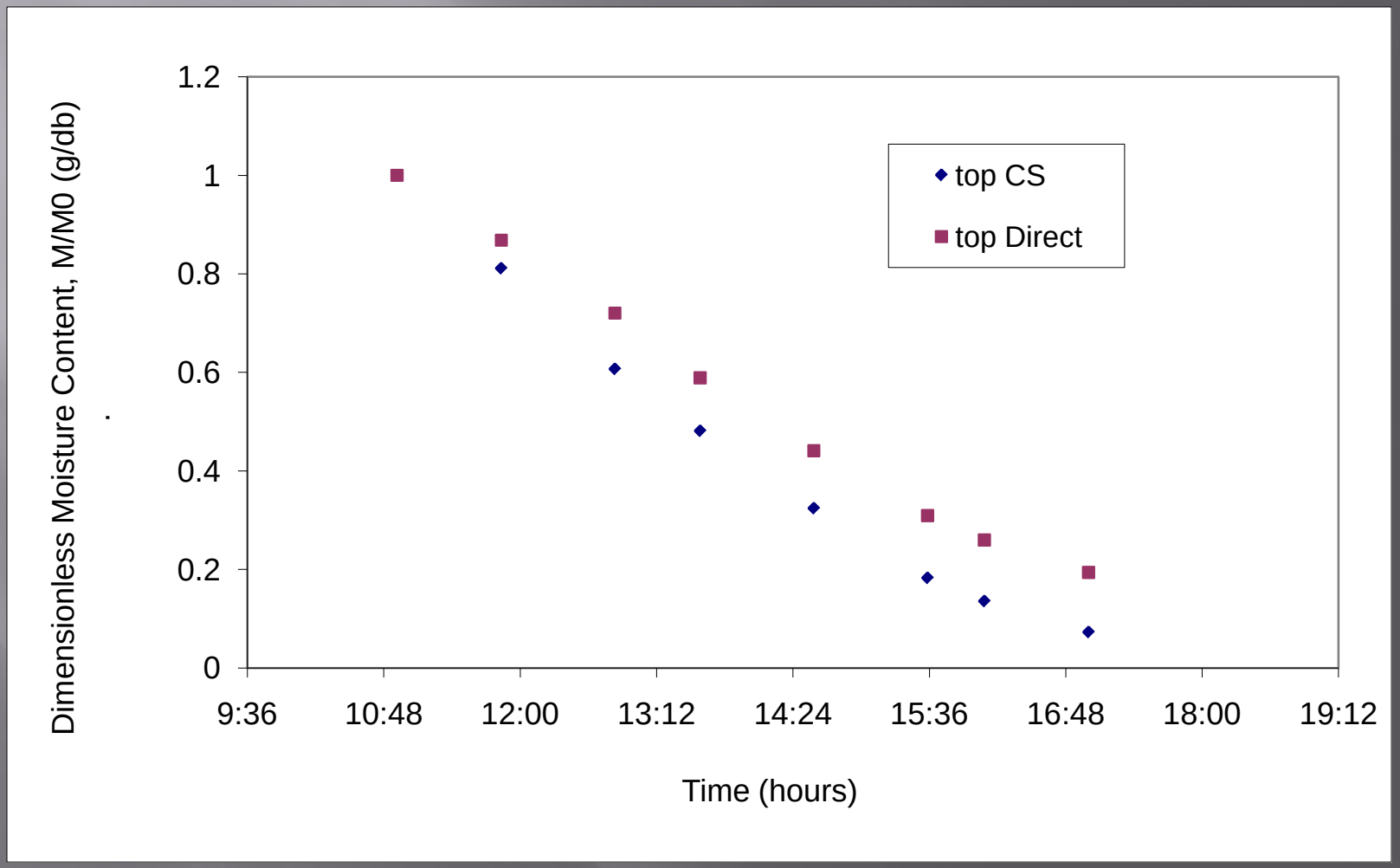
Testing/Results

- Sunny Day
- Degree Days: CS: 35.093 No-CS: 33.87003 ~3.5% difference



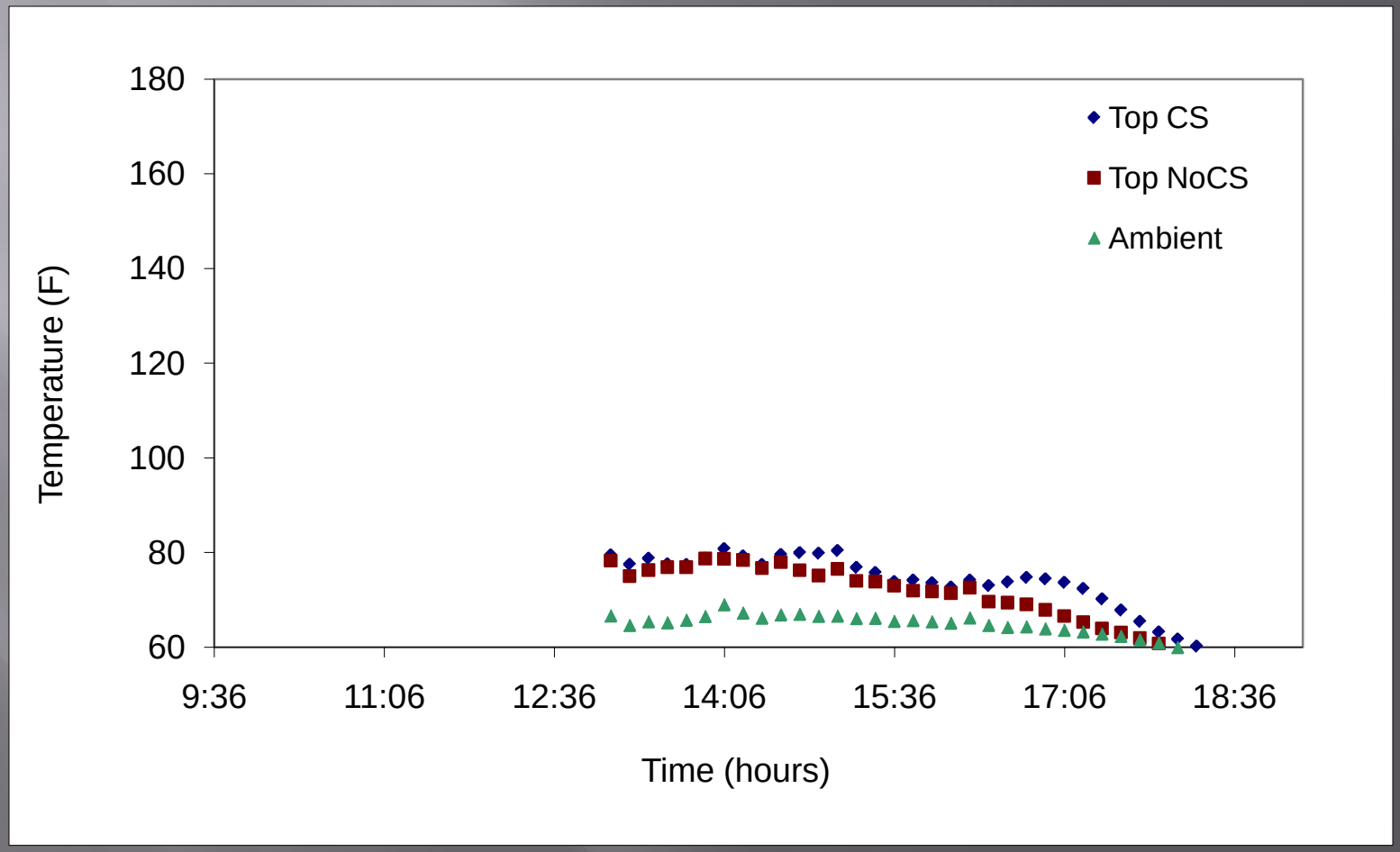
Testing/Results

- Example: Sunny Conditions



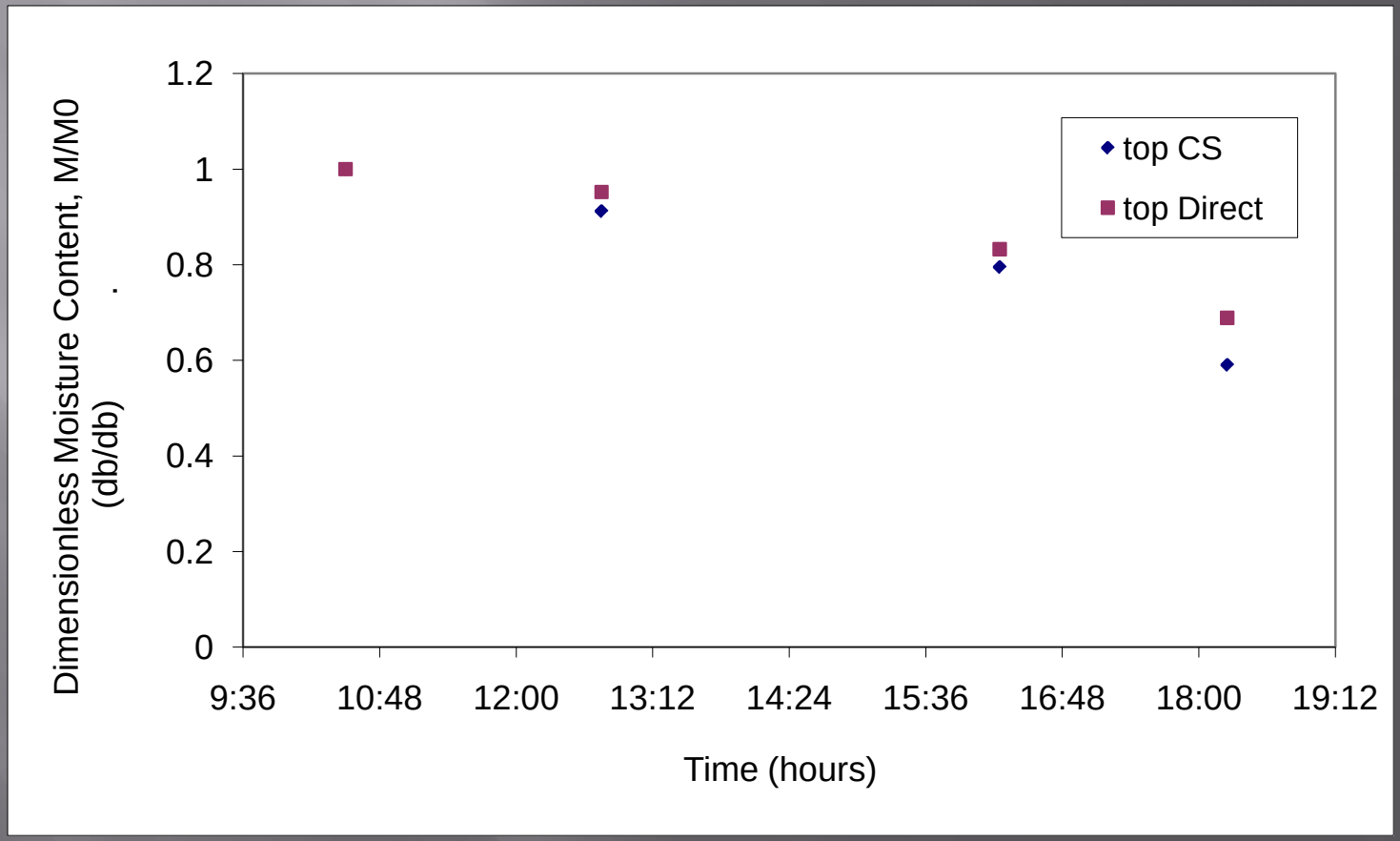
Testing/Results

- **Simulated Hazy Conditions**
- **Degree Days: CS: 16.15387 No-CS: 15.93778 ~2.0% difference**



Testing/Results

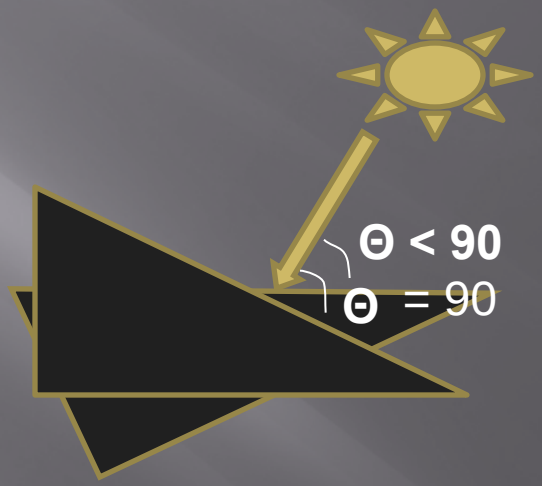
- Simulated Cloudy and Cold Conditions



Some Methods to Improve Results

- Increase Absorber Area

- Angle the Absorber area such that the sun's rays are normal to the surface



- Introduce modified parabolic reflectors to further concentrate solar energy

- Utilize Solar Charts for tracking