

MAGIC update 2011-11-22

This is the first in a series of weekly updates on MAGIC, a project involving deployment of radars and other instruments on a Horizon Lines cargo ship going that traverses the route from Los Angeles to Hawaii and back from October, 2012 to September, 2013 with the purpose of investigating clouds and climate (<http://www.arm.gov/news/features/post/15256>). The principal investigators are myself (Ernie Lewis) of Brookhaven National Laboratory and Warren Wiscombe of NASA.

The purposes of these updates are twofold. First, they will provide regular information on the progress of the MAGIC endeavor. Secondly, I will write about other topics in which readers might be interested. I am hoping that these updates will serve as a vehicle of science education so that those who are not atmospheric scientists can gain an appreciation and understanding of some of the topics being studied in this field. I have attached a brief overview of the MAGIC project (also available at <http://www.ecd.bnl.gov/MAGIC/MAGIC%20overview%202011-11-22.pdf>), which my sister, a non-scientist, was kind enough to review for me. I was quite happy that she said that it was “understandable,” as it is the goal for all of these updates.

If you do not wish to receive these postings please let me know (elewis@bnl.gov) and I will immediately remove you from the distribution list. Conversely, if you know of anyone who might be interested please send me their email and I will add it to the list. Please contact me with any questions or comments. These postings and other information on MAGIC will be available at <http://www.ecd.bnl.gov/MAGIC.html>.

Several of us visited the cargo ship Horizon *Spirit* a few weeks back and were graciously hosted by Captain Tom McCarthy, who showed us the *Spirit* and answered questions. **We are extremely grateful to Horizon Lines for providing a platform for this deployment and for enabling this project to occur!** Current activity on MAGIC involves determining how our instruments can be installed on the *Spirit* and planning for an evaluation cruise (Leg0) in January, 2012. Deployment of two radars is expected for MAGIC, one of them vertically pointing and one (hopefully) scanning. The installation plan must ensure that these radars (and

other instruments) have clear views of the sky and of the sea surface (for remote temperature readings) while at the same time not interfering with Horizon's activities. I and two others are going on Leg0 from Los Angeles to Hawaii and back in January to measure the ship's motion, investigate locations for launching weather balloons, and familiarize ourselves with ship routines and operation. Characterization of the ship motion will aid in construction of so-called "stable tables" which will allow one of the radars and other instruments to remain pointing directly upward as the ship rocks from side to side (hopefully there will not be much other motion, as I get seasick!).

The science topic today is "climate" and "weather," two terms that may cause confusion. Weather is the current state of the atmosphere: temperature, relative humidity, pressure, wind speed and direction, precipitation, etc. Climate is the long-term average of weather. For instance, I don't know what the weather where I live (Long Island, NY) will be this coming January 1, but I do know what to expect—it will be cold. It may turn out not to be cold, but if someone is coming for a visit I would recommend that they pack a heavy coat. The best summary I've heard is: "*Climate is what you expect, weather is what you get.*" Weather is nearly impossible to predict accurately more than a few days advance, but climate is a different beast, and much effort (including MAGIC) is expended in attempting to understand and predict climate. Some of this will be discussed in future updates. Other topics that will be discussed include clouds, cloud modeling, aerosols, the science team, the importance of the transect, the instruments being used, radars, aerosols, radiation (NOT radioactivity), weather balloons, Horizon, our DOE funding agency, and what MAGIC stands for; other suggestions are welcome.

Ernie Lewis

2011-11-22