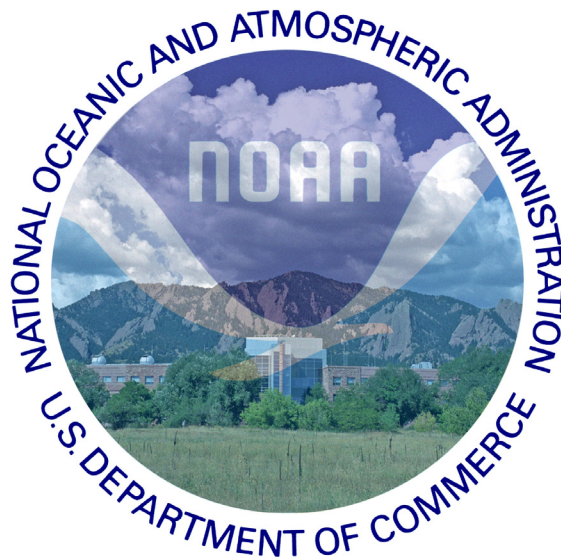


I. Patents and CRADAs



ESRL Physical Sciences Laboratory Review

David Skaggs Research Center
Boulder, Colorado
March 9-12, 2010

GSD Patents and CRADAs

Significance and impact of involvement with patents, Cooperative Research and Development Agreements (CRADAs) and other activities with industry, other sectors, etc.

Atmospheric Sondes and Method for Tracking Patent

Patent Number: US 6,421,010

Date of Patent: July 26, 2002

Inventors: Dr. Russell B. Chadwick; Dr. Alexander E. MacDonald

A system for wind profiling comprised of balloon-borne sondes with transmitters that enable identification of the sondes and the angle of arrival (AOA) of signals from the sondes so that they can be tracked. In the preferred embodiment, the signal transmitted by each sonde is a phase-shift-keyed (PSK) signal. The carrier phase difference as measured at two spaced antennas is measured to provide an accurate but ambiguous measure of the difference in distance of the path length between the sonde and receivers, and the symbol phase difference is employed to remove the ambiguity. The difference in path length is then used to determine AOA. Atmospheric data and the sonde identification are encoded using a pseudo-random sequence (PRS) of the PSK signals.

Science On a Sphere® Patent

Patent Number: US 6,937,210

Date of Patent: August 30, 2005

Inventor: Dr. Alexander E. MacDonald

Science On a Sphere® (SOS) is a room sized global display system that uses computers and video projectors to display planetary data onto a six foot diameter sphere, analogous to a giant animated globe. Dr. Alexander MacDonald invented Science On a Sphere® and researchers at NOAA developed Science On a Sphere® as an educational tool to help illustrate Earth System science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere to explain complex environmental processes in a way that is simultaneously intuitive and captivating.

CRADA between NOAA/OAR and Google, Inc.

Established: January 20, 2010

Duration: Five years

This agreement provides for collaborative work toward the visualization, communication, and compilation of scientific data and information about the world's oceans, atmosphere, and climate for the benefit of the scientific community and the public. The wealth of oceanographic, meteorological, biological, and climatological data and products that NOAA collects and produces combined with the software capabilities and public reach that Google, Inc. offers is expected to lead to great benefits for both collaborators and the general public.

PSD Patents and CRADAs

Significance and impact of involvement with patents, Cooperative Research and Development Agreements (CRADAs) and other activities with industry, other sectors, etc.

PSD's predecessor organization, the NOAA Environmental Technology Laboratory (ETL), formerly the Wave Propagation Laboratory (WPL), had a very long history of technological innovation focused on the development of a wide array of ground-based, airborne, and ship-mounted sensing systems for atmospheric, ocean, and land/ice observations, with an emphasis on remote sensing systems (e.g., radar, lidar, sodar, radiometer). Details of associated technology transfer activities can be found on the [PSD Technology Transfer](#) site. PSD continues that innovation today, but within a more limited scope that includes sensors and systems focused on water-cycle, air-sea, and polar observations. Cooperative Research and Development Agreements and patents associated with current PSD technologies are described below.

Cooperative Research and Development Agreements (CRADAs)

PSD is a CRADA partner with [Vaisala](#), a Finnish company specializing in weather observations, and [Sonoma Technology, Inc.](#), a U.S. company specializing in meteorological and air quality measurements. The CRADA was established in 1991 among predecessor organizations “to develop and improve commercial versions of the experimental 915 MHz wind and temperature profilers previously demonstrated by the Aeronomy and Wave Propagation Laboratories of OAR...” The following PSD staff members serve or have served on the CRADA Management or Engineering Review Board established to provide collaboration oversight:

William Neff, Member, Management Review Board, Vaisala Cooperative Research and Development Agreement (1991–Present)

Marty Ralph, Member, Management Review Board, Vaisala Cooperative Research and Development Agreement (2002–Present)

Allen White, Member, Management Review Board, Vaisala Cooperative Research and Development Agreement (2007–Present)

Tina Schiffbauer, Member, Management Review Board, Vaisala Cooperative Research and Development Agreement (2008–Present)

Barbara Herrli, Member, Management Review Board, Vaisala Cooperative Research and Development Agreement (2000–2007)

Jim Jordan, Member, Engineering Review Board, Vaisala Cooperative Research and Development Agreement (1991–Present)

Dave Carter, Member, Engineering Review Board, Vaisala Cooperative Research and Development Agreement (1991–Present)

Paul Johnston, Member, Engineering Review Board, Vaisala Cooperative Research and Development Agreement (1991–Present)

Daniel Wolfe, Member, Engineering Review Board, Vaisala Cooperative Research and Development Agreement (1991–Present)

Vaisala and Sonoma Technologies, Inc. continue to be active partners in the transfer of CRADA technology to the commercial sector. A recent example is an automated planetary boundary layer detection scheme for wind profiler radars that was transferred to Vaisala through the CRADA. The algorithm is now being sold by Vaisala as part of their radar data processing package.

Patents

Jordan, James R., Churnside, James H., Johnston, Paul E., *Detection of transient signals in Doppler spectra*, patent pending, November 8, 2007.

White; Allen B., Gottas; Daniel J., Ralph; F. Martin, Neiman; Paul J., *Operational bright-band snow level detection using Doppler radar*; 6,615,140; September 2, 2003

Jordan; James R., Abbott; Scott W., Templeman; Brian D., *Wavelet filtering of sodar signals*; 6,097,669; August 1, 2000

Jordan; James R., Lataitis; Richard J., *Removing buoy motion from wind profiler moment data*; 5,872,535; February 16, 1999

Solheim; Frederick, **Jordan; James R.,** Wilson; John, *Antenna system with edge treatment means for diminishing antenna transmitting and receiving diffraction, sidelobes, and clutter*; 5,963,176; October 5, 1999

Jordan; James R. , Chadwick; Russell B. (GSD), *Process for generating wind profiler data free of fixed ground clutter contamination*; 5,686,919; November 11, 1997

Jordan; James R., Strauch; Richard G., *Statistical quality control of wind profiler data*; 5,689,444; November 18, 1997

Jordan; James R., *Wind profiling radar*; 5,592,171; January 7, 1997 (licensed to Vaisala)