Paytsar MURADYAN

Home Country
Armenia

Degree
PhD in Atmospheric Sciences

Expertise
Physics

Research Focus
Atmospheric Profiling Using Airborne Radio Signals

Host University
Purdue University, United States

Fellowship Awarded
2007

Paytsar Muradyan was brought up in Armenia in a family of scientists and exposed to mathematics and physics at a young age. She has two sisters and a brother and believes that the family unit is the first and most important environmental influence. She and her husband, a doctoral student in physics at Purdue University in Indiana, United States, have one daughter.

As a doctoral student in atmospheric sciences at Purdue, Paytsar's research is focused on profiling the atmosphere with a Radio Occultation (RO) technique using an airborne GPS receiver on board a research aircraft.

In this technique the GPS radio signals are recorded at a moving receiver as it sets behind the horizon. The GPS signal is refracted passing through the atmosphere and its travel time is delayed due to variations of atmospheric refractivity. The magnitude of the signal's refraction depends on the temperature and concentration of water vapor in the atmosphere and provides an almost instantaneous depiction of the atmospheric state.

Because the relative position between the GPS satellite and the airborne receiver changes over time, a vertical scanning of successive layers of the atmosphere is accomplished. These high-vertical-resolution temperature and humidity measurements are useful for understanding the large-scale dynamics of weather systems and air-surface interactions.

Current meteorological observation systems under-sample humidity fields over oceans using low-vertical-resolution spaceborne sounders, infrequent drop-sondes, and ship-launched radiosondes. Airborne RO has the potential to provide humidity data from the surface to the mid-troposphere, and may be a valuable tool for improving precise weather prediction globally and regionally.

Paytsar plans to teach at Yerevan State University in Armenia.