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WINDOW

measurements in the visible and short wave infrared portions of the spectrum with $500,000 worth of optical instrumentation. Dr. Stuart Biggar and Dr. Ed Zawleski, both research scientists at the U of A, had previously used this equipment to support calibration of sensors on the recently launched NASA Terra satellite. John Graves of Boeing KSC was the overall test conductor and arranged all the needed personnel to handle the glass and the ground support equipment critical to the success of the test. Dr. Eppler helped put the safety review package together and provided support for the test along with Runco and personnel from Boeing Houston and Huntsville. It was a real team effort!

When asked about the results of the test, Dr. Scott said, "The tests went really well and the support down at KSC was fantastic. So far we know that the transmittance of the window port is excellent with greater than 98 percent transmittance in some areas of the visible spectrum. We did find that the transmittance does change greatly in the blue end of the spectrum with changing view angle, but that other bands didn't show as much change. Overall the data looks really good, and it is just what the scientists need so that they can design payloads for the WORF."

There are several exciting Earth science research projects in conceptual stages. For example, the WORF will be an ideal setup for validating current land use and land cover maps that are being generated using satellite remote sensing measurements. To determine the accuracy of these satellite-derived land use map products, validation must occur with observations over a global suite of known test sites, and ISS WORF will be well suited for this research. This has the potential to revolutionize how these maps are made and could significantly enhance their applications.

Because of its high optical quality, the nadir window on Destiny will allow the use of large aperture telescopes without having the light captured for the image blurred by the windows. That capability, plus the WORF, will make for some excellent high-resolution images.

"The station was advertised as a laboratory for science," said Runco. "One of the particular scientific fields advertised was remote sensing and Earth science. We could have done remote sensing with only external sensors located on the station's truss, but that would not have taken advantage of having the intelligent sensor, the human being, on orbit. It made sense to have an optical window on the world, if you will, beyond what has been previously available – the side hatch window on the shuttle. So the synergistic effect of the optical quality of the window and the intelligent user will make for a very strong platform for Earth science."

Dr. Lulla sees robotic spin-offs resulting from this Earth science platform aboard the ISS. There is a connection between what transpires during a human space flight program and what results in the development of robotic satellites, he says. He points to the Landsat concept, which grew out of the Apollo Program.

"I view the International Space Station as an exciting Earth science platform and an engineering and technology test bed. Before we launch an automated satellite to make measurements of some part or process of the Earth, we will be able to test that on station with a prototype. We will be able to validate that it works and then take that and use it as a free-flying satellite. That is the story and that is the contribution that human space flight has always made to Earth science activities that are now done robotically."

Who knows what robotic spin-offs will result from Earth observations made aboard the station. ■

NASA JSC Photo 2000e15241 by Robert Markowitz

Kamlesh Lulla, Ph.D, chief of JSC's Office of Earth Sciences

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