

SES07-2007-020012

Abstract for an Invited Paper  
for the SES07 Meeting of  
the American Physical Society

### **The Liquids Reflectometer at the SNS<sup>1</sup>**

JOHN F. ANKNER, Neutron Scattering Sciences Division, Oak Ridge National Laboratory

We have designed and constructed a horizontal-surface reflectometer as one of the first instruments at the Spallation Neutron Source. This instrument is designed to view liquid and solid surfaces in specular, off specular, near-surface small angle scattering, and crystalline diffraction geometries. The guide system supplies  $2 \text{ \AA} < \lambda < 16.5 \text{ \AA}$  neutrons at vertical incident angles ranging from  $0^\circ < \alpha_i < 5.5^\circ$  for free liquid surfaces and up to  $45^\circ$  for solid surfaces. Three bandwidth choppers, synchronized with the spallation source and operating at 15-60 Hz, provide neutrons in bandwidths ranging from 3.5-14  $\text{\AA}$  at a fixed  $\alpha_i$  onto a sample. The sample stage enables all of the motions necessary for positioning liquid and solid surfaces, while the detector arm allows position-sensitive or pencil  $^3\text{He}$  detectors to view the sample at specular or off specular angles up to  $90^\circ$  and can scan out of the specular plane by up to  $30^\circ$ . We will report on our progress commissioning the liquids reflectometer, which essentially involves making the vast parameter space accessible to the instrument accessible to expert and novice users in a coherent and reliable fashion. We have already served our first users and will present examples of data collected, demonstrate our data acquisition and analysis packages, and discuss instrument status.

<sup>1</sup>In collaboration with Candice E. Halbert and Xiaodong Tao, Neutron Scattering Sciences Division, Oak Ridge National Laboratory; and Mike Kilbey, Department of Chemical Engineering, Clemson University.