1125-55-1181 **Cliff Joslyn**, **Kathleen Nowak**, **Brenda Praggastis**, **Emilie Purvine*** (emilie.purvine@pnnl.gov) and **Michael Robinson**. *Computations for Local and Pseudo Sections in Real-world Sheaves.* Preliminary report.

Sheaves of vector spaces on abstract simplicial complexes (ASCs) can represent the consistency between multiple data feeds: vector spaces record the possible values returned by a source, and restriction maps encode the consistency relationships among interacting sources as coded in an ASC. Global sections of a sheaf can be computed via sheaf cohomology, indicating readings from the sources which are consistent by equality according to the restriction maps and the structure of the ASC. But actual measurement of real-valued data fail equality conditions due to noise and resolution issues. The GPS on a cell phone and a fitness watch may both be on the same person, and return slightly different coordinates, but we may want to consider them consistent up to some tolerance. We address these issues through two closely related new concepts. Local sections cover the ASC with sets of data feeds that are maximally consistent, revealing the quality of a sheaf assignment. Pseudo and approximate sections can establish a consistency structure to represent degree of tolerance or uncertainty. The degree of approximation tolerance establishes a filtration of maximal local sections, from all sensors possibly being distinct at zero tolerance to all sensors being equivalent at maximal tolerance. (Received September 15, 2016)