The ground-based SAR instrument IBIS-L allows the remote monitoring of mass movements at distances up to 4 km with high precision and resolution. It delivers every 5 to 10 minutes an image containing amplitude and phase information with a spatial resolution of 0.5 m (range) by 4.4 mrad (cross-range). To determine displacement, phase unwrapping is a critical step in the analysis.

A real-time capable Persistent Scatterer analysis package is presented that allows the analysis of the state of a mass movement with the least delay possible (a few minutes to one hour) after an interferogram is formed. The selection of the correct ambiguities at one time step is made based on the computation of probabilities for each possible ambiguity using Kalman filtering techniques. By adding new interferograms the probabilities of the past time steps are improved until the ambiguities can be fixed. By that the first ambiguity solution for one time step is available a few seconds to minutes after the observation is finished. The final/fixed solution is available a few observations later.

Exemplary, results of monitoring the landslide Steinlehnen, located near Innsbruck in the Austrian Alps, are presented. The landslide was monitored continuously for one month. The highly variable weather conditions caused considerable movements during this period. An acceleration of the landslide was observed during heavy rain and snowfall with a following slowing down of the rate of motion when the weather changed to dry conditions again.