Robust control of varying weak hyperspectral target detection with sparse non-negative representation

Abstract:

In this study, a multiple-comparison approach is developed for detecting faint hyperspectral sources. The detection method relies on a sparse and non-negative representation on a highly coherent dictionary to track a spatially varying source. A robust control of the detection errors is ensured by learning the test statistic distributions on the data. The resulting control is based on the false discovery rate, to take into account the large number of pixels to be tested. This method is applied to data recently recorded by the three-dimensional spectrograph Multi-Unit Spectrograph Explorer.