

File Type	Content	Purpose
.hspy	Full PCA decomposition output (loadings, factor maps, metadata)	Enables dimensionality reduction and component analysis
.npy (cluster map)	Cluster label map from GMM	Encodes the <i>mineralogical phases</i>
.npy (mask cube)	3D binary mask cube, one layer per GMM cluster	Used for spatial back-projection and phase-specific quantification
.json (cluster means)	Mean EDS spectrum per cluster	Used to identify elements and compute partition coefficients
.json (metadata)	Calibration metadata (spatial and energy axes)	Required to convert raw data into physically meaningful coordinates
.png (cluster map)	Visualisation of the cluster/phase map	For qualitative assessment and reporting
.png (cluster mask)	Individual binary masks for each cluster	Useful for targeted region analysis
.png (mean spectrum)	Plot of the mean spectrum for Cluster 0 (repeatable)	Used for quick validation of phase composition