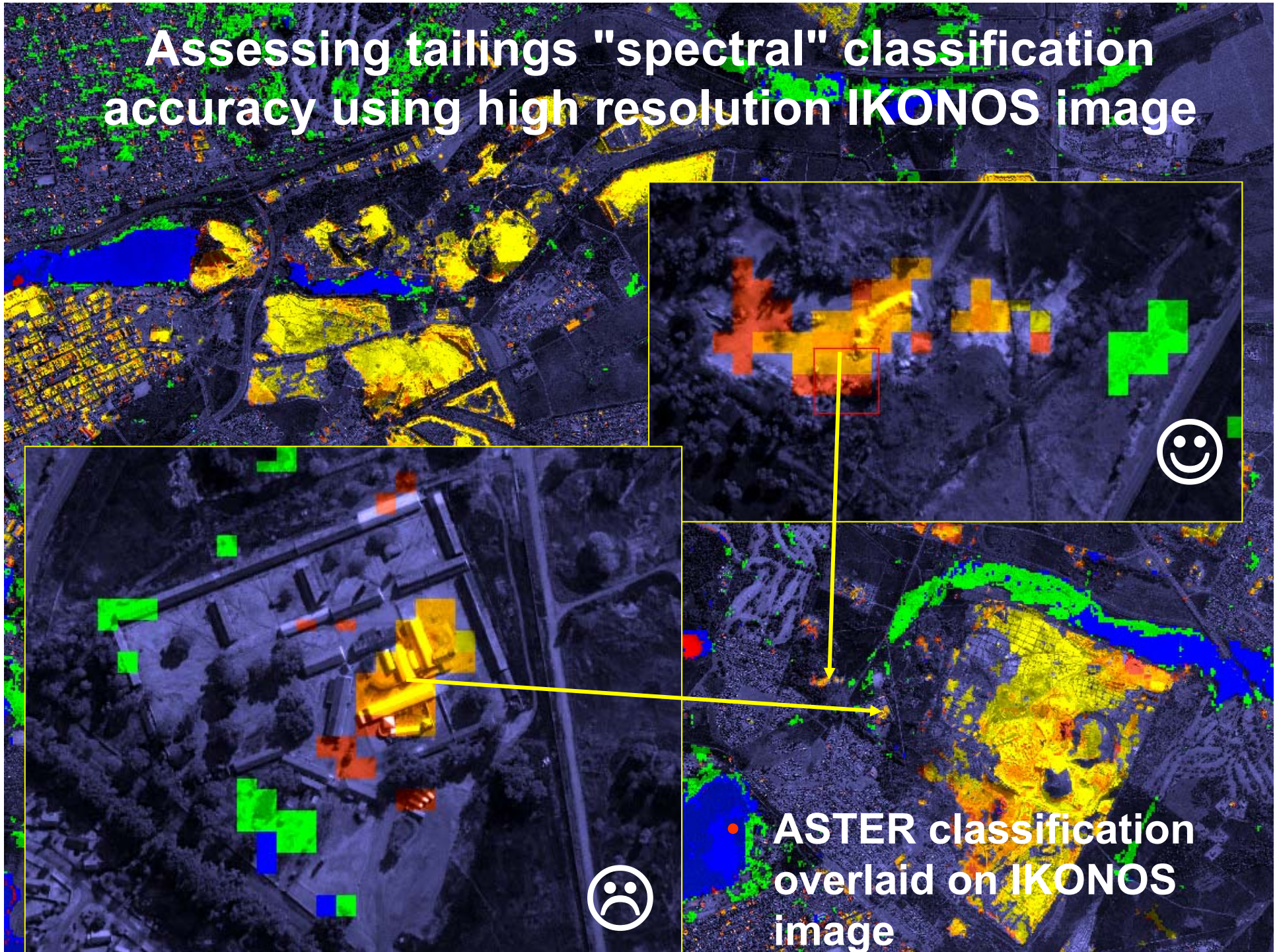


# Data fusion

- processing together various EO data sets through different combination of them
- Development of routines to allow the synergetic analysis of satellite based and airborne imagery by up-scaling and down-scaling procedures
- dominant spectral patterns produced by minor components with strong absorption features can significantly affect the pixel "spectral signature"
- Data fusion could help hence in
  - Unmixing spectra through a better understanding of the pixel relevant surface features influenscing spectral components percentages
  - Validate image classification based only on spectral features by visually indentifying the classified surface objects



# Assessing tailings "spectral" classification accuracy using high resolution IKONOS image





# Feature extraction

Feature extraction is a complementary processing of data fusion, based on –object-oriented image classification.

It hence enables identification of surface features:

to be used in further unmixing of impure pixels in hyperspectral images

to classify surface features to be further used as base layer in GIS analyses

Feature extraction is a complex task in image processing which is closely linked to other problems as image segmentation or image classification.

- **Objectives**

- identification in a digital image, of groups of pixels belonging to the same entity from the realworld (feature).

- **Software**

- ENVI Feature Extraction Module (ENVI Fx) allows a semi-automatic approach to quickly and easily extract features from high-resolution imagery.

- It uses an object-based approach to identify and define features,

- Easy to use : Intuitive and highly interactive workflows => the user can always preview the result of each step, seeing the impact of the chosen values in real time.

- **Datasets**

- Panchromatic or multispectral base image, HR images

- Ancillary data sets, such as elevation models, to provide additional criteria when segmenting and defining features.

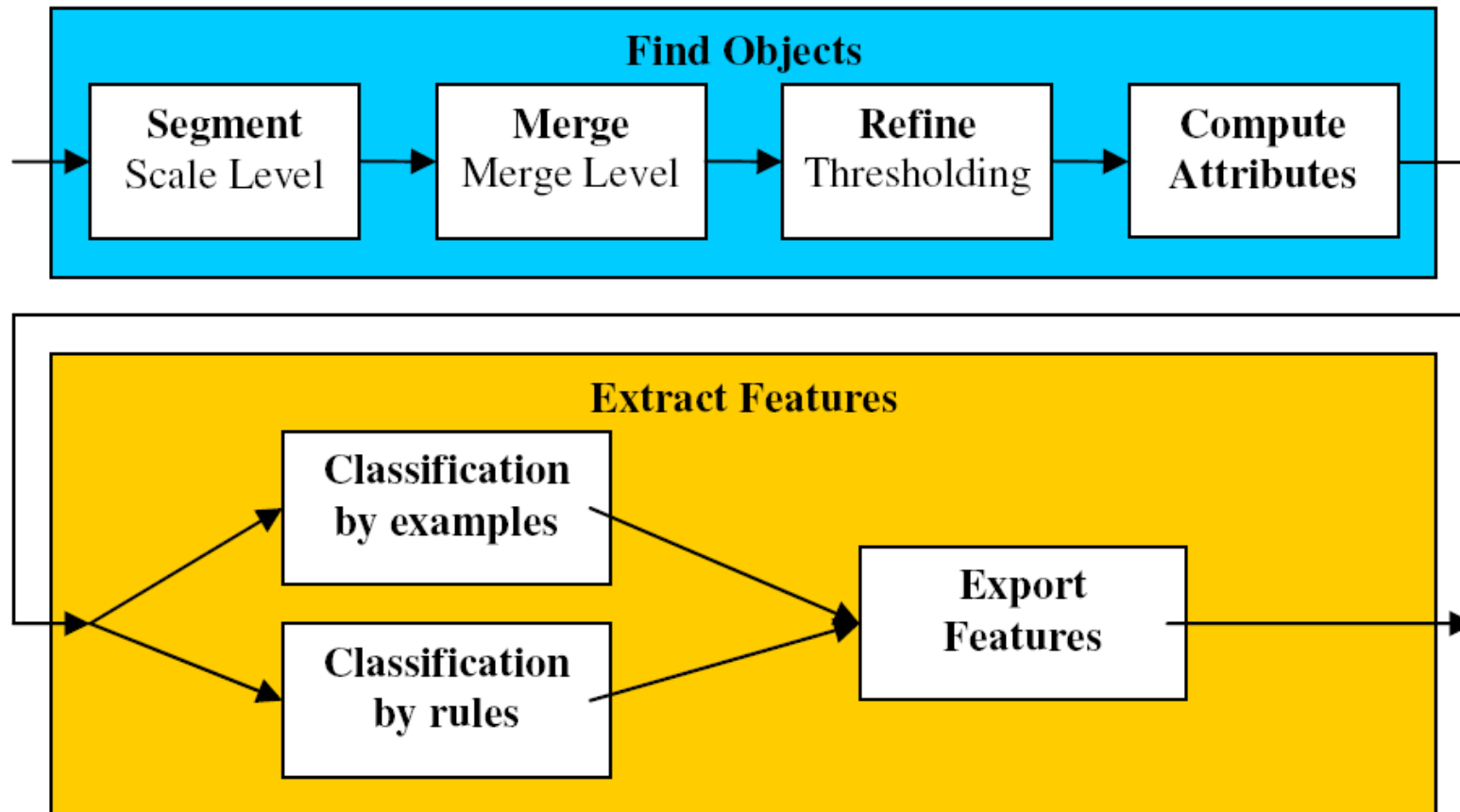
- **Results**

- several options for defining features to be extracted as

- vectors,

- perform supervised or rule-based classification.

# Feature extraction workflow



# Example



- Quickbird image
- Segmentation has been done
- Classification by rules has been used