Precise Forest Classification Applying the Unmixing Methods

Hristo Nikolov and Denitsa Borisova

SSTRI-BAS, Acad. G. Bonchev bl.3, 1113 Sofia, Bulgaria, (hristo,dborisov)@stil.bas.bg

During the recent years many field observations have been made over open pit mines in two industrialized regions. As rule the most stricken areas are the nearby forestry. As first step in the posterior process of rehabilitation is the precise allocation of the forest types in the close areas. This will facilitate the decision making in the re-establishment of the forest areas and minimize the efforts in the selection of the most suitable types of trees. In the focus of this research we put the availability of multispectral data with different spatial and temporal resolution from airborne sensors (satellite and aerial) for the region. From this data after processing we establish regression dependencies between multispectral data and the mixed forest types found in the region. In this study data from different sources are used – raster imagery from different year over the same area and vector data from three CORINE projects. Also some in-situ multispectral data from the region under study was collected by the authors using the Thematically Oriented Multichannel Spectrometer (TOMS) – designed in STIL-BAS and data from freely available spectral libraries for the same tree plants. All those data was processed by linear unmixing methods in order to find correct proportions of the coniferous and deciduous types of plants which are considered to improve the subsequent classification. The results will be communicated to the company in charge in order to provide them with the most suitable types of trees to be planted in the area subject to re-cultivation. As next step we offered the same firm to monitor the same areas during the next years in order to verify the rehabilitation activities.

Keywords: mixed pixels, satellite and in-situ multispectral data, forest management