Image compression allows for a decrease in the amount of necessary storage space from the usual 8 bits per pixel. In this project, a multiwavelet packet transformation is used as part of a compression routine for a class of homogeneous images. Specifically, we work with satellite images. These files are extremely large and consist of several channels. We will describe the compression algorithm and in particular, the significant role spectral density analysis plays in developing an optimal multiwavelet packet transformation. Examples of the algorithm will be included throughout the presentation. (Received September 22, 2010)