Title: Structuring contemporary remote sensing image fusion

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Abstract: The exploitation of multi-sensor images at pixel level is a widely implemented research field in Earth observation. In this context, image fusion plays an important role since it effectively combines complementary image content to enhance information contained in the individual datasets. This article presents an overview of the existing fusion techniques and their achievements for Earth scientists. This research started off with the compilation of a database on remote sensing image fusion journal publications. Research results were exploited, grouping the literature into different aspects of relevance. Six categories of information have been built according to the journal, the application, sensors that provided the images used in the case study, applied fusion techniques, areas of achievement, and on-going research highlighting unresolved questions and current science. This resulted in an overview on the categorisation of image fusion techniques, explanation of the various approaches used within a certain category, and description of particularities when dealing with the fusion of optical and radar imagery. Even though many researchers intend to find the best algorithm, there is a greater need to define an appropriate workflow prior to processing the imagery with the knowledge in all related fields, that is, remote sensing image fusion and the desired application to address the different aspects of error propagation.