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Defining brightness-shape-moisture soil parameters for Southern Africa from Hyperion Hyperspectral Imagery

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An effective methodology is needed to simulate soil spectra on a large scale. The brightness-shape-moisture (BSM) radiative transfer model (RTM) is used to simulate soil spectra for different semiarid and arid biomes within Southern Africa based on hyperspectral imagery obtained from the Hyperion satellite. Such simulation based on hyperspectral data is especially relevant in light of newer hyperspectral missions, such as Prisma providing ongoing data streams. In this particular study, Hyperion's data are cleaned using the SUREHYP procedure, segmented using the simple linear iterative clustering (SLIC) algorithm, filtered to exclude photosynthetic and senescent vegetation, and parameterized via a Hyperion band calibrated BSM model lookup table to obtain simulation parameter distributions for different biomes. This provides a means to better simulate soil spectra using each biome's obtained parameter distributions in the BSM forward model.