

Abstract

A compact spectrometer operable in a wavelength range of 4.5 or more microns includes an entrance slit, a collimating mirror, a grating, a focusing mirror and a first focal plane. At least some radiation passing through the slit follows an optical path in which at least some radiation passing through the slit is reflected by the collimating mirror onto the grating, which in turn reflects at least some radiation onto the focusing mirror, which in turn reflects and focuses at least some radiation at a first focal plane and onto the two-dimensional array of detectors. Each column in the two-dimensional array of detectors corresponds to a wavelength in the 4.5 or more micron range, the two-dimensional array includes a plurality of columns that collectively correspond to wavelengths spanning the 4.5 or more micron range, and each adjacent pair of columns in the two-dimensional array of detectors corresponds to two wavelengths that differ by an equal amount. The entrance slit, the collimating mirror, the grating, the focusing mirror and the first focal plane are positioned within a volume that is equal or less than 192 cubic inches in size.