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(54) Title: INTEGRATED CIRCUIT SPECTROMETER

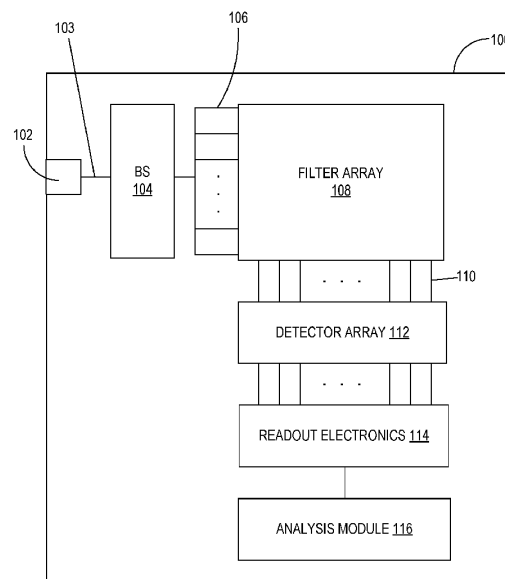


Figure 1

(57) Abstract: An integrated circuit spectrometer comprises a photonic circuit comprising: an optical input port for receiving light from a light source; and a filter array of filter elements, such as microring resonators, in optical communication with the optical input port. Each microring resonator is characterized by a different series of resonance wavelengths. If alternative filter elements are used, the filter elements may have different filter peaks to each other. The integrated circuit spectrometer also comprises a plurality of detectors, each of which is associated with one of said microring resonators to detect photons from an output of the microring resonator; and at least one processor configured to reconstruct, from signals received at the detectors, an input spectrum of the light received at the optical input port. The input spectrum may be reconstructed by an artificial neural network.

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