



US006713764B2

(12) **United States Patent**
Chavez et al.

(10) **Patent No.:** US 6,713,764 B2
(45) **Date of Patent:** Mar. 30, 2004

(54) **FIELD BASED SPECTRAL RADIOMETER**

Primary Examiner—David Porta

(75) **Inventors:** Pat Chavez, Flagstaff, AZ (US); Stuart C. Sides, Flagstaff, AZ (US)

Assistant Examiner—Christine Sung

(74) *Attorney, Agent, or Firm*—Mark Homer

(73) **Assignee:** The United States of America as represented by The Department of Interior, Washington, DC (US)

(57) **ABSTRACT**

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 133 days.

A robust two spectral band radiometer for long-term stand-alone spectral radiance measurements in the field is provided. The instrument can be used to monitor various surface parameters over prolonged periods of time by automatically collecting spectral radiance measurements at a user selected time interval (minutes to days). Two main applications are the monitoring of water surface parameters, such as total SSC and turbidity, and on-land vegetation by collecting spectral radiance measurements in a broad visible red and near-infrared spectral bands. Use for other application is possible using different spectral bands and multiple radiometers. Also included is the use of a ratioing technique to correlate the spectral radiance values rather than spectral reflectance values to the surface parameters of interest; this simplifies both the filed instrumentation requirements and post processing procedures.

(21) **Appl. No.:** 10/073,323

(22) **Filed:** Feb. 13, 2002

(65) **Prior Publication Data**

US 2003/0150992 A1 Aug. 14, 2003

(51) **Int. Cl.**⁷ G01J 3/00

(52) **U.S. Cl.** 250/339.05; 250/339.01

(58) **Field of Search** 250/339.01, 339.05, 250/338.1, 336.1

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,161,075 A * 12/2000 Cohen 702/3

* cited by examiner

12 Claims, 1 Drawing Sheet

Grand Canyon Gage
Silt/Clay vs Radiance Ratio Ratio

