



## METHOD FOR MEASURING AND/OR COMPENSATING AN ABERRATION IN AN IMAGE ACQUIRED BY AN OPTICAL INSTRUMENT COMPRISING AN ARRAY OF MULTISPECTRAL DETECTORS

### Technological advantages

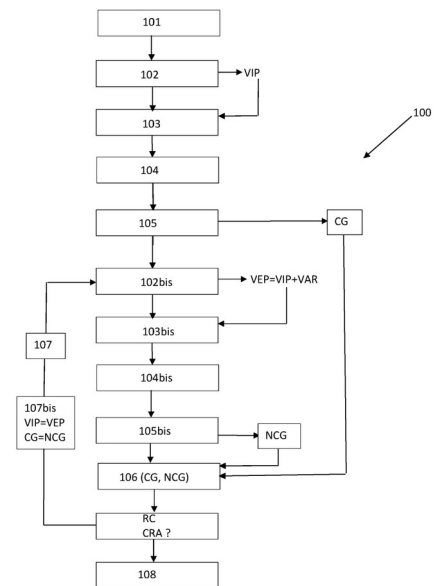
- Improvements in the accuracy for the optical instrument physical parameters,
- Calibration for the instrument actuators and for the correction systems,
- Few known source point images required,
- Motion assessment (vibrations),
- Tracking assessment (satellite pointing drift).

### Invention synthesis

The invention deals with the calibration of an optical instrument including a multi-spectral sensor array and including a spectral filter array each associated with a spectral band. Observing a known point source (for example a star) allows for the optical aberrations compensation using a parametric modeling of an impulse response. The optical aberration measurement is determined on the basis of the estimated value for the impulse response parameters. The measurement gets more accurate as the number of spectral filter arrays is increased.

### Potential applications

- All optical instruments equipped with multi-spectral sensors,
- Earth observation (lands, coast lines, vegetation...),
- Paintings and documents analysis,
- Weather predictions,
- Tracking of military targets, ...



### Scheme implementation

- 101) acquisition of a known point source
- 102) determination of an initial value for the parameters of an impulse response model
- 103) sampling
- 104) computation of the cost based on a distance between the computed and observed impulse response
- 105) computation of a global cost for all the spectral bands
- 102b) estimation of the parameters values
- 103b) sampling
- 104b) cost computation
- 105b) global cost computation
- 106) comparing costs from 104b and 105b
- 107) repeat

### Commercial benefits

- Large simplifications in the operational conditions,
- Estimation of all the optical parameters of an optical model (mirrors, positioning, rotation, ...).

*Patented invention - under license.*