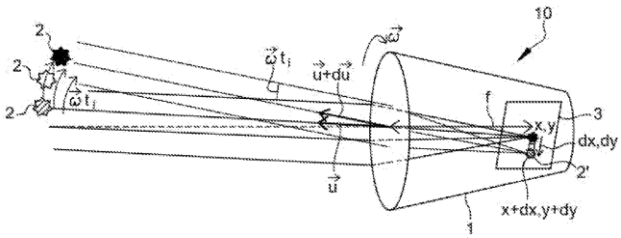
METHOD AND DEVICE FOR OPTICAL DETECTION

Technological advantages

Efficient system :

- The use of very far objects (stars) does not require the knowledge of the sensor linear velocity.
- Stellar sensors only use the angular velocity from an inertial sensor.
- The signal / noise ratio for the corrected image is independent of the object relative speed.



Schematic view presenting the spread of a star image

(1) Image sensor
(2) Object to detect (e.g. star)
(3) Image plane
(u) Travel speed
(ω) Angular speed

Invention synthesis

The invention deals with a method for the optical detection of objects.
Stellar sensors for attitude and orientation control use fixed referenced points (such as stars). During the lock-on phase with high angular velocities, the detection may be difficult. Also, the stellar sensor quality (its signal to noise ratio) may degrade the fixed points detection capabilities.
The invention uses the stellar sensor angular velocity (for example from a rate gyro), computes the travel speed of a virtual point. An integration time based on the travel speed is used to obtain a raw image. From the integration time and travel speed, a reference image is computed based on the estimated displacement. From the raw and reference images, a corrected image is created where the fixed points can be accessed.

Commercial benefits

- Improves satellites reliability (attitude and orientation control) especially for small stellar sensors present on micro and nano satellites.

Potential applications

- Satellites attitude and orientation control (especially for nanosat, satellites with high angular velocities).

Patented invention - under license.

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For more information :

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