

Jupiter and Saturn impact detection project

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Abstract

A long-term project for detecting impact of small bodies in Jupiter's atmosphere has been running since 2012. We here present the latest developments of the software used for it, and the latest impact frequency estimations resulting from the project.

1. Introduction

Since 2011, professionals made softwares (dtc and JID) available for amateurs to be used on their Jupiter acquisition videos with the aim to detect potential flashes resulting from small bodies impacts in Jupiter atmosphere (see [1]).

In 2012, an amateur made an evolution of one of this software in order to not only focus on flashes detection, but also on collecting all negative analysis in order to refine the impact frequency estimations, launching the DeTeCt project (see [2]).

Since then, several evolutions piloted by professional and amateur resources improved the project (see [3], [4], [5]) and more than 90 000 acquisitions have been analysed.

2. Principles

The principle of the project is to have each amateur use DeTeCt software on his own acquisition and check and send the results of the analysis, based on two different algorithms.

The first one aims at identifying burst of brightness in a short area of the atmosphere on the planet, while the second generates detection images for the user to check, showing the maximum value of each pixel of the acquisition over time minus its mean value (see figure 1).

Then the detection logs generated by DeTeCt are sent to the project coordinator, who runs an analysis on all logs collected to identify simultaneous observations to be ruled out and calculate from an impact frequency estimation from the duration of the acquisitions analysed.

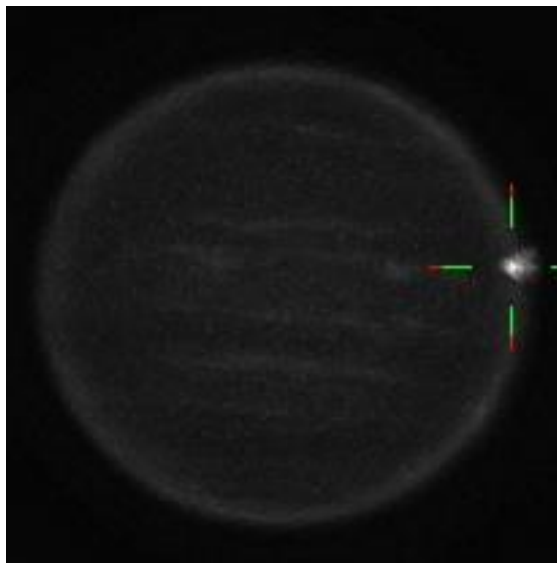


Figure 1: DeTeCt detection image from John Mc Keon's March 17th, 2016 acquisition video showing the 4th impact flash discovered.

3. Latest evolutions

The latest developments of DeTect are in 3 different directions.

In order to increase the amount of data processed, usage of DeTeCt was simplified by offering an easy to use Graphical User Interface (see figure 2).

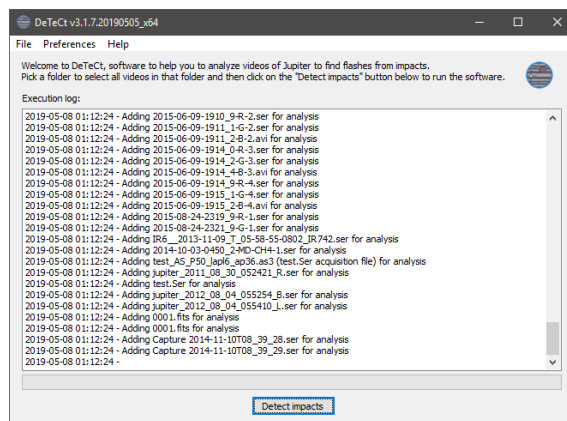


Figure 2: DeTeCt software

