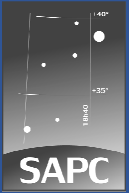# LOW COST SETUP FOR NUMERICAL CAMERA

## Lionel Rousselot

### Société Astronomique Populaire du Centre

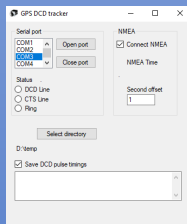tesse.lionel@free.fr

## Software

Images acquisition

Acquisition of UTC time from GPS (need PPS to work)

## Hardware

GPS GARMIN 18x lvc

DB9 CONNECTOR

Numerical camera

USB/Serial converter
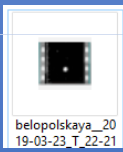
### TOTAL COST < 200€ (without camera)

## How it works ?

### 1/ ACQUISITION

Video timestamped with « computer time »

→ Done with Genika Astro

belopolskaya__20 19-03-23_T_22-21
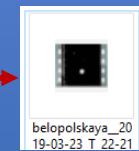
Creation of a database for comparison of « computer time » and « GPS time »

→ Done with « DCD tracker » include in Genika Astro

DCD GPS timing file
23-03-2019_time_ 21-01-29.stp
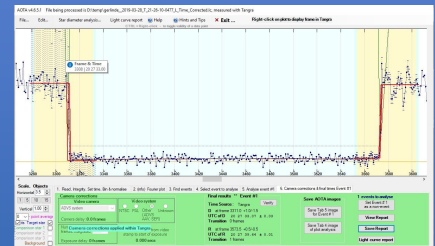
### 2/ SYNCHRONISATION

belopolskaya__20 19-03-23_T 22-21
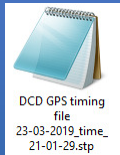
New video timestamped with « GPS time » (Possibility to record it on .ADV format)

→ Done with « SER toolbox » include in Genika Astro

### 3/ ANALYSIS

« Standard » analysis with Tangra sofware and AOTA

## RESULTS

(71) Niobe 2019 Feb 10   106.9 ±11.7 x 77.3 ±1.6 km, PA 81.8° ±4.6°
Geocentric X -828.4 ±4.5 Y 1068.7 ±0.9 km

(663) Gerlinde 2019 Mar 28   98.0 ±2.7 x 82.2 ±6.3 km, PA 49.1° ±14.4°
Geocentric X 2404.3 ±1.0 Y 4362.6 ±3.0 km