Monitoring the pointing of the prototype LST-1 using star reconstruction in the Cherenkov camera

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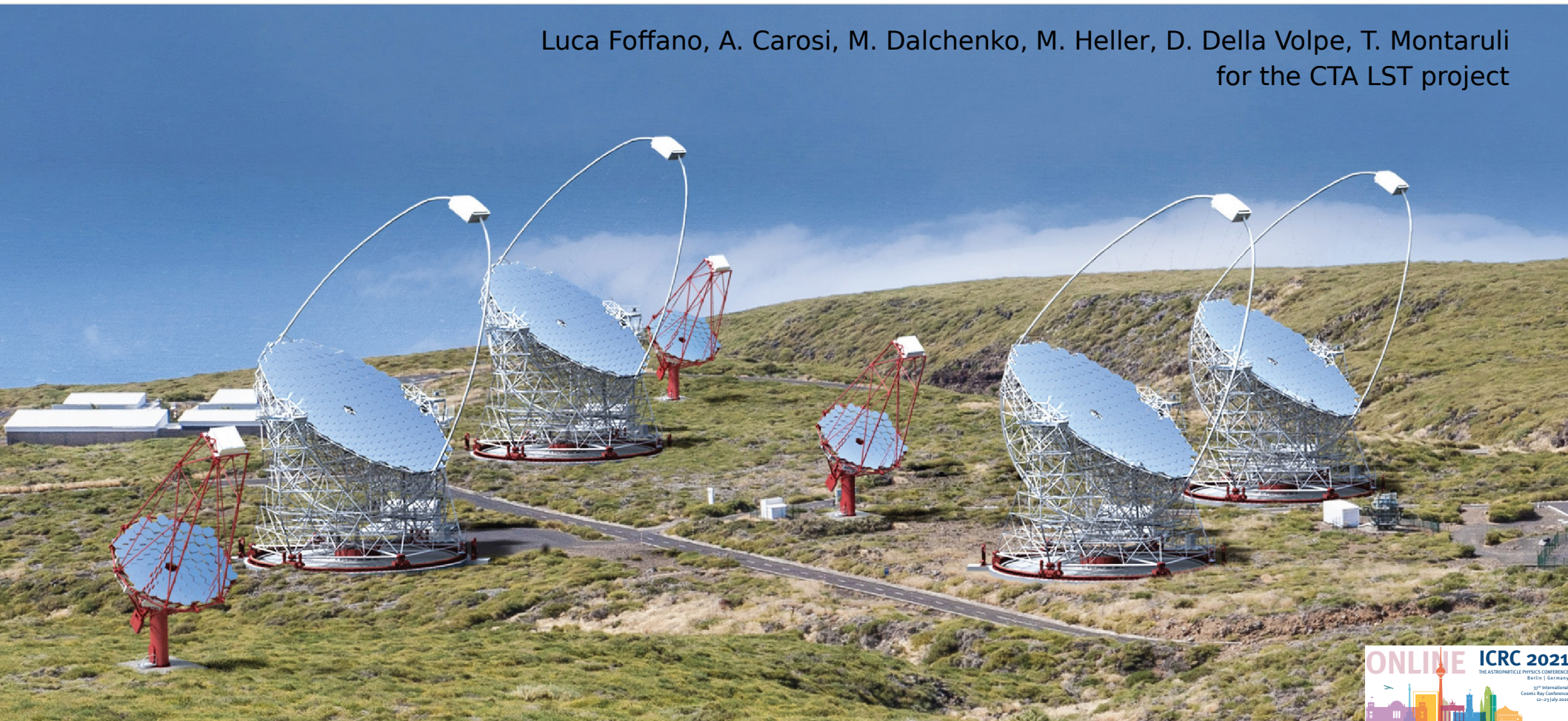


The *star tracking* method

Introduction

Structure deformations are one of the main causes affecting the pointing accuracy of the telescopes.

In the Large-Sized Telescopes (LSTs), they are traditionally monitored through the combination of several CCD cameras, inclinometers, and other devices:

- These devices provide corrections that are applied to the data during the **offline** data analysis.
- The **online** corrections rely on the elaboration of a specific **bending model**, that represents a set of instructions applied to the drive system during the observations in order to automatically compensate for deviations due to the structure bending.

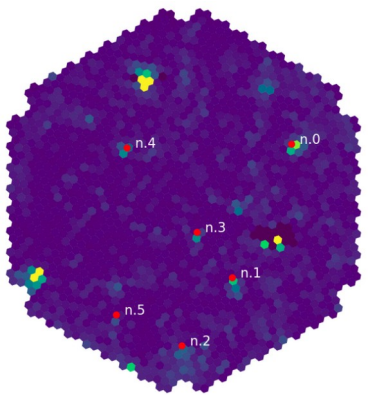
The *star tracking* method

This method represents a complementary and more direct method to

- monitor the telescope pointing accuracy;
- provide an **independent cross-check** of the corrections applied with the bending model.

How it works

It uses the **stars in the FoV** as a monitoring tool. The starlight is reflected into the camera, and contributes to the background of the events recorded during the observations.



The *star tracking* method

Advantages

- The method does not require any additional hardware or specific technical observations;
- It can be applied to **any telescopes of CTA**, even when not equipped with specific pointing devices.
- It can provide a **retroactive** analysis providing information about the historical improvements of the telescope pointing.
- Since it uses all the triggered events, it can reach **high monitoring frequencies** (more than 4 Hz), comparable to the standard devices.
- the star tracking method can be used offline but also as a **real-time** pointing monitoring tool.