

67P Coma Dust Particle Tracking

A Quick Overview

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General Concept & Idea

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Project Structure:

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Project Structure:

- ▶ Step I: Tracking particles

General Concept & Idea

Project Structure:

- ▶ Step I: Tracking particles
- ▶ **Step II: Determine origin**

General Concept & Idea

Project Structure:

- ▶ Step I: Tracking particles
- ▶ Step II: Determine origin
- ▶ **Step III: ???**

General Concept & Idea

Project Structure:

- ▶ Step I: Tracking particles
- ▶ Step II: Determine origin
- ▶ Step III: ???
- ▶ **Step IV: Profit**

Step I: Tracking particles

Previous work

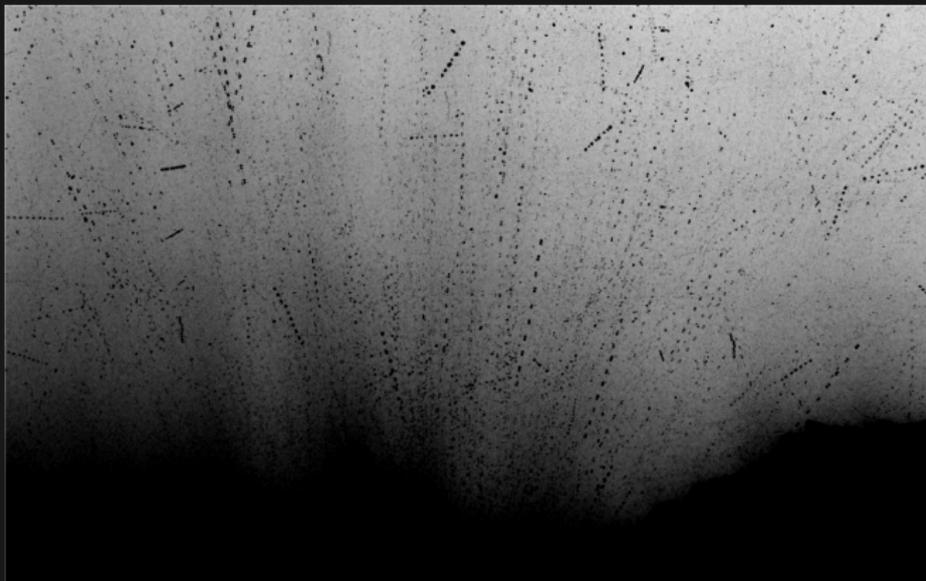


Figure 1: Cutout of a 20 images stack (Agarwal et al., 2016)

Step I: Tracking particles

Detection

Step I: Tracking particles

Detection

Step I: Tracking particles

Previous work

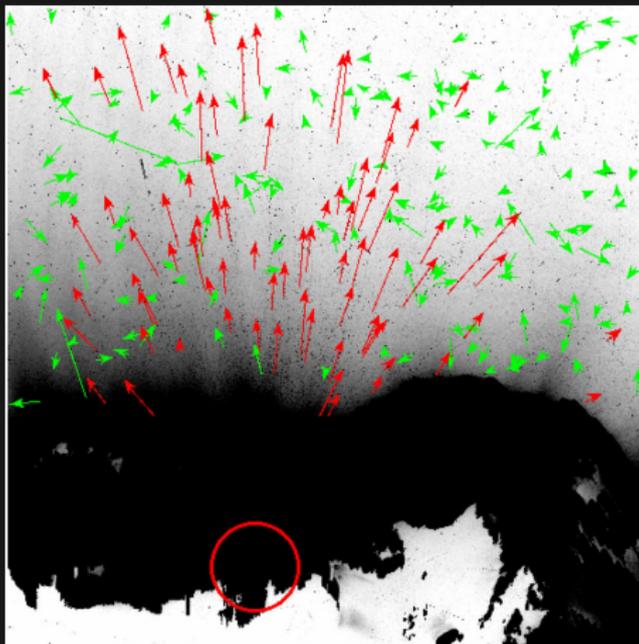
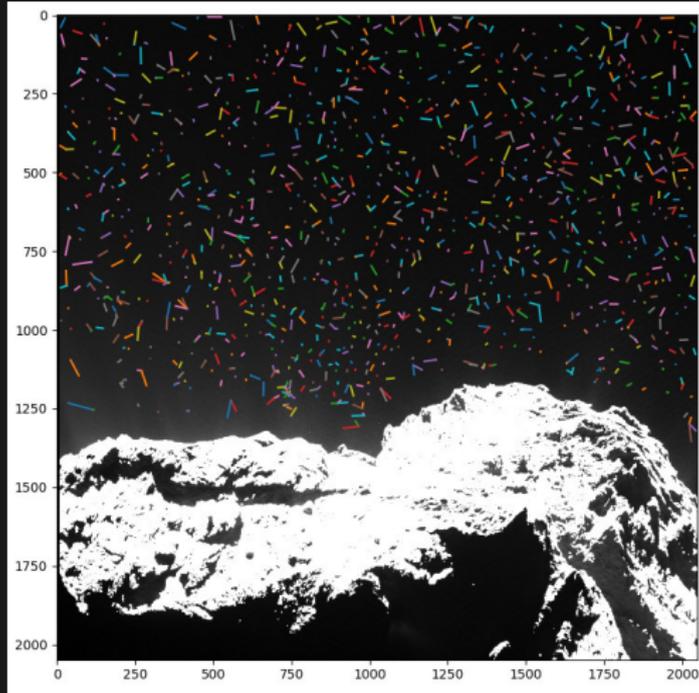


Figure 4: Manually obtained particle tracks (Agarwal et al., 2016)

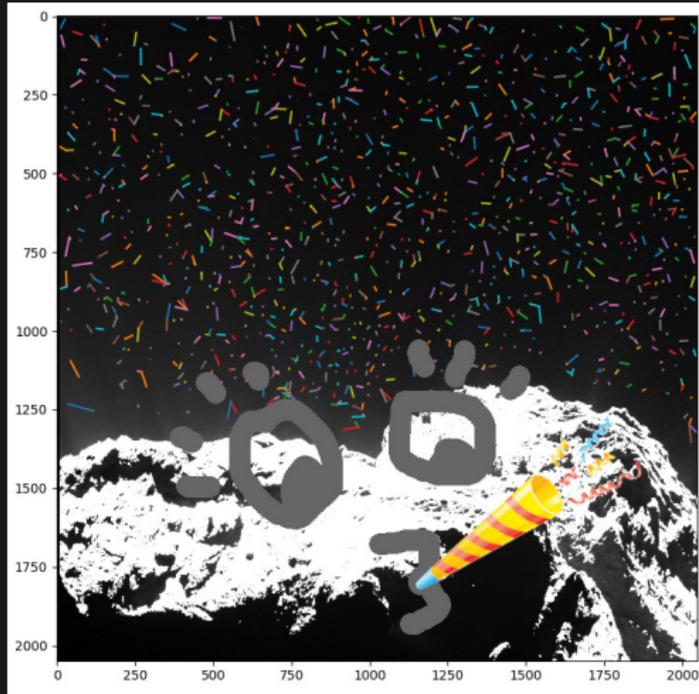
Step I: Tracking particles

Tracking



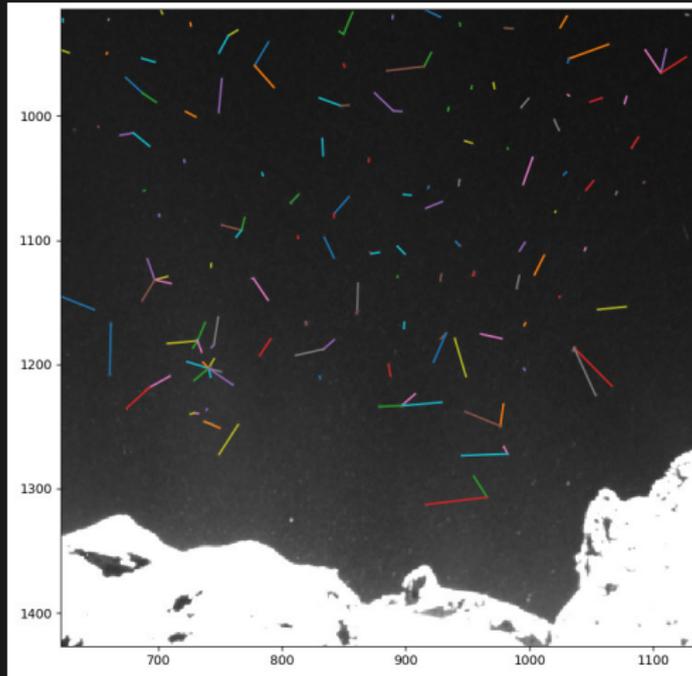
Step I: Tracking particles

Tracking



Step I: Tracking particles

Tracking



Step II: Determine Origin

Previous work

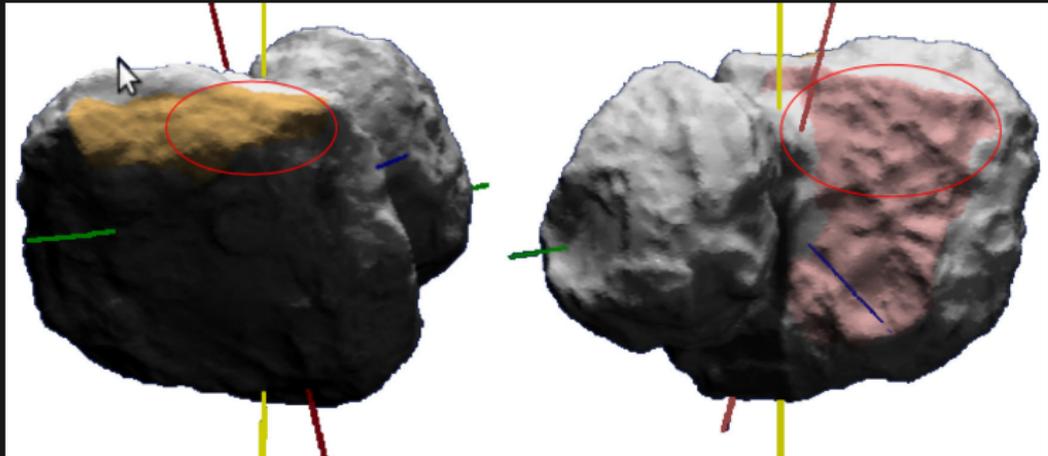


Figure 8: Potential source regions *Khonsu* and *Seth* (Agarwal et al., 2016)

Step III: ???

Previous work

Step III: ???

Previous work

Physical interpretation:

Step III: ???

Previous work

Physical interpretation:

- ▶ **Ice content**

Step III: ???

Previous work

Physical interpretation:

- ▶ Ice content
- ▶ **Recoil from asymmetric outgassing**

Step III: ???

Previous work

Physical interpretation:

- ▶ Ice content
- ▶ Recoil from asymmetric outgassing
- ▶ **Conditions during/for ejection**

Step III: ???

Previous work

Physical interpretation:

- ▶ Ice content
- ▶ Recoil from asymmetric outgassing
- ▶ Conditions during/for ejection
- ▶ **Significance for entire comet population**

Step III: ???

Previous work

Physical interpretation:

- ▶ Ice content
- ▶ Recoil from asymmetric outgassing
- ▶ Conditions during/for ejection
- ▶ Significance for entire comet population
- ▶ ...

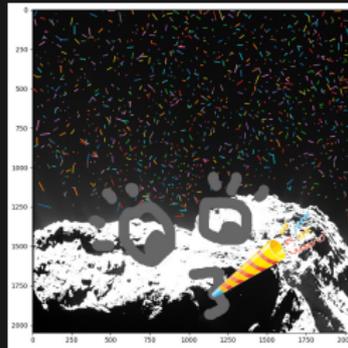
Step IV: Profit

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PhD

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PhD



Bibliography I

AGARWAL, J., GICQUEL, A., GÜTTLER, C., TUBIANA, C., SIERKS, H., DELLER, J., VINCENT, J.-B., KRAMM, J.-R. ET AL. (2016) Acceleration of individual, decimetre-sized aggregates in the lower coma of comet 67P/Churyumov–Gerasimenko. Monthly Notices of the Royal Astronomical Society, **462**(Suppl_1), S78–S88.