Statistical physical analysis of the dynamics of foraging bumblebees

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Bridging the Gaps End of Year Workshop
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Queen Mary
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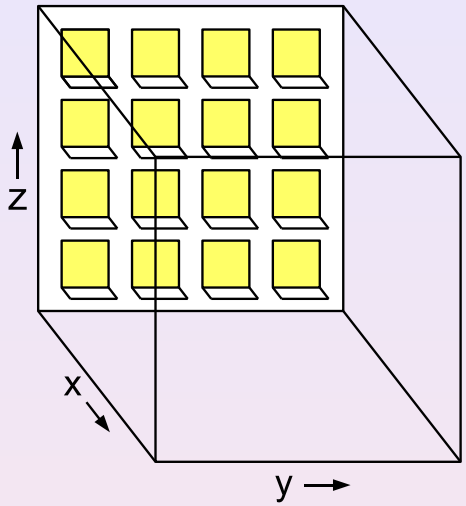
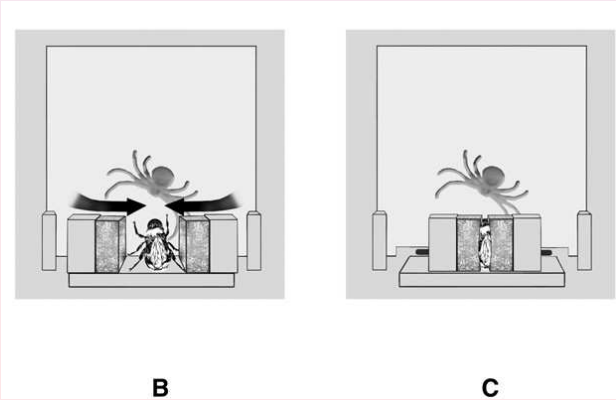
Project in a nutshell

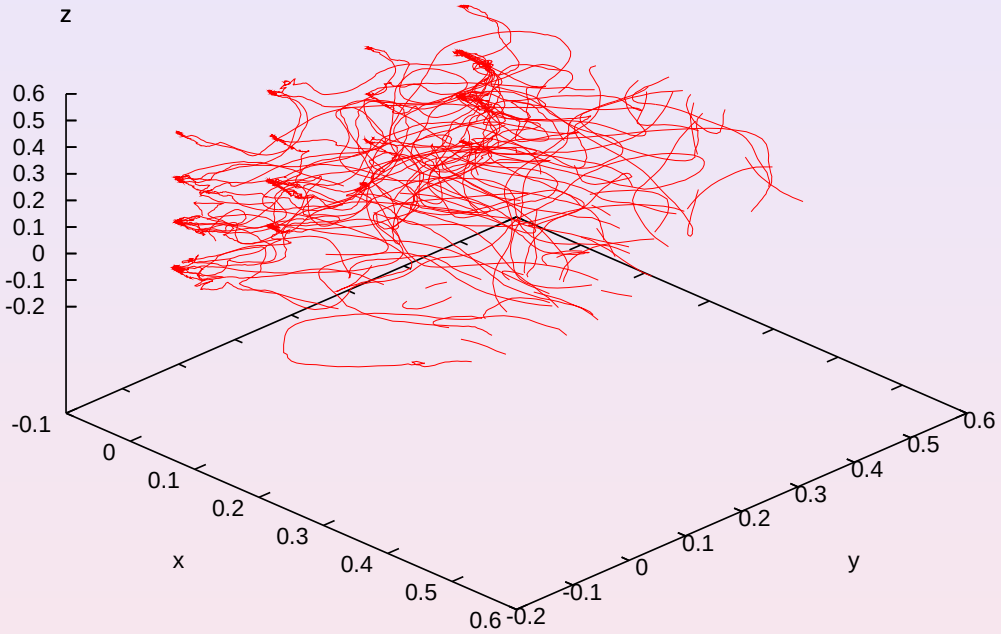
artificial flowers in a box . . .



. . . partially equipped with artificial spiders



record flights of single bees

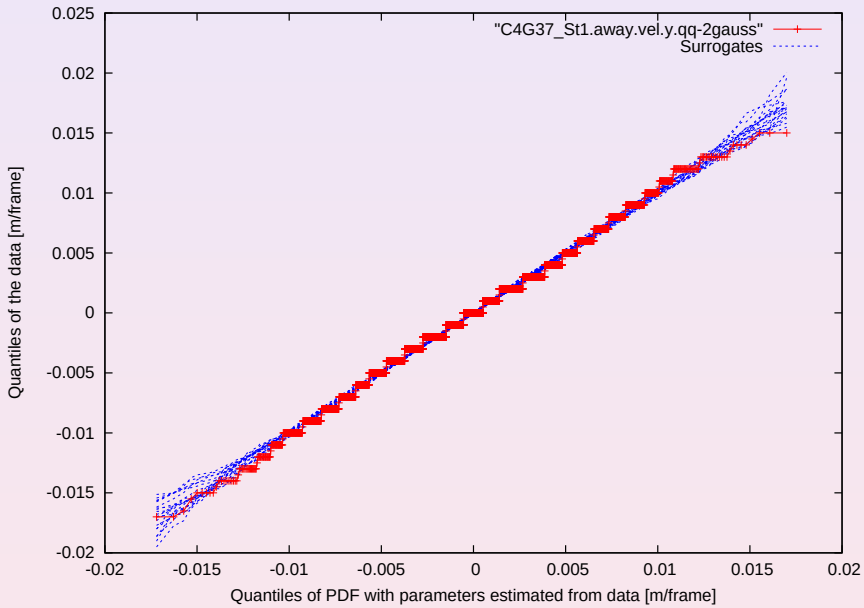


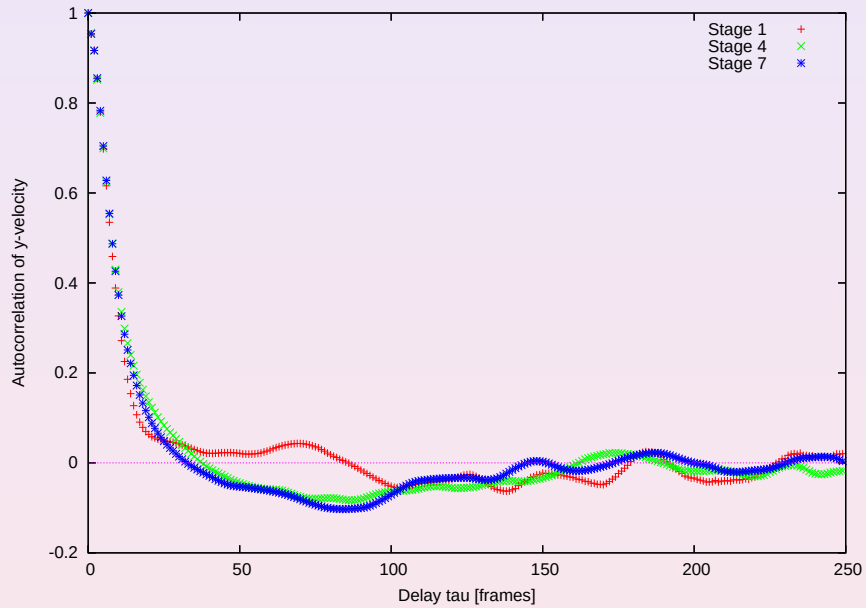
BTG project:

examine flight trajectories by statistical physical analysis

Key results

- **no change** in *statistical distributions* of bee velocities with or without spiders. . .
- . . . **but** the *temporal correlations* of the bee velocities are very different





⇒ **new result:** no change in **statistics** but in **memory**!

At variance with conventional analysis of foraging behavior.

What else achieved?

- BTG startup led to **awarding funding for a PhD student** for this project
- **workshop organized (2009)** on *Understanding the Dynamics of Foraging Bumblebees* (4 speakers, 20 participants)
- **workshop organized (2010)** on *Mathematical Modeling of Dynamics in Biological Systems* (7 speakers, 25 participants)

To do

- **submit two papers** on results (data analysis, mathematical modeling) to high-impact journals
- **new experiment** on bee foraging in 3d flower carpets currently in progress (M.Lihoreau, L.Chittka, SBCS)
- **follow-up EPSRC grant proposal** envisaged for 2011