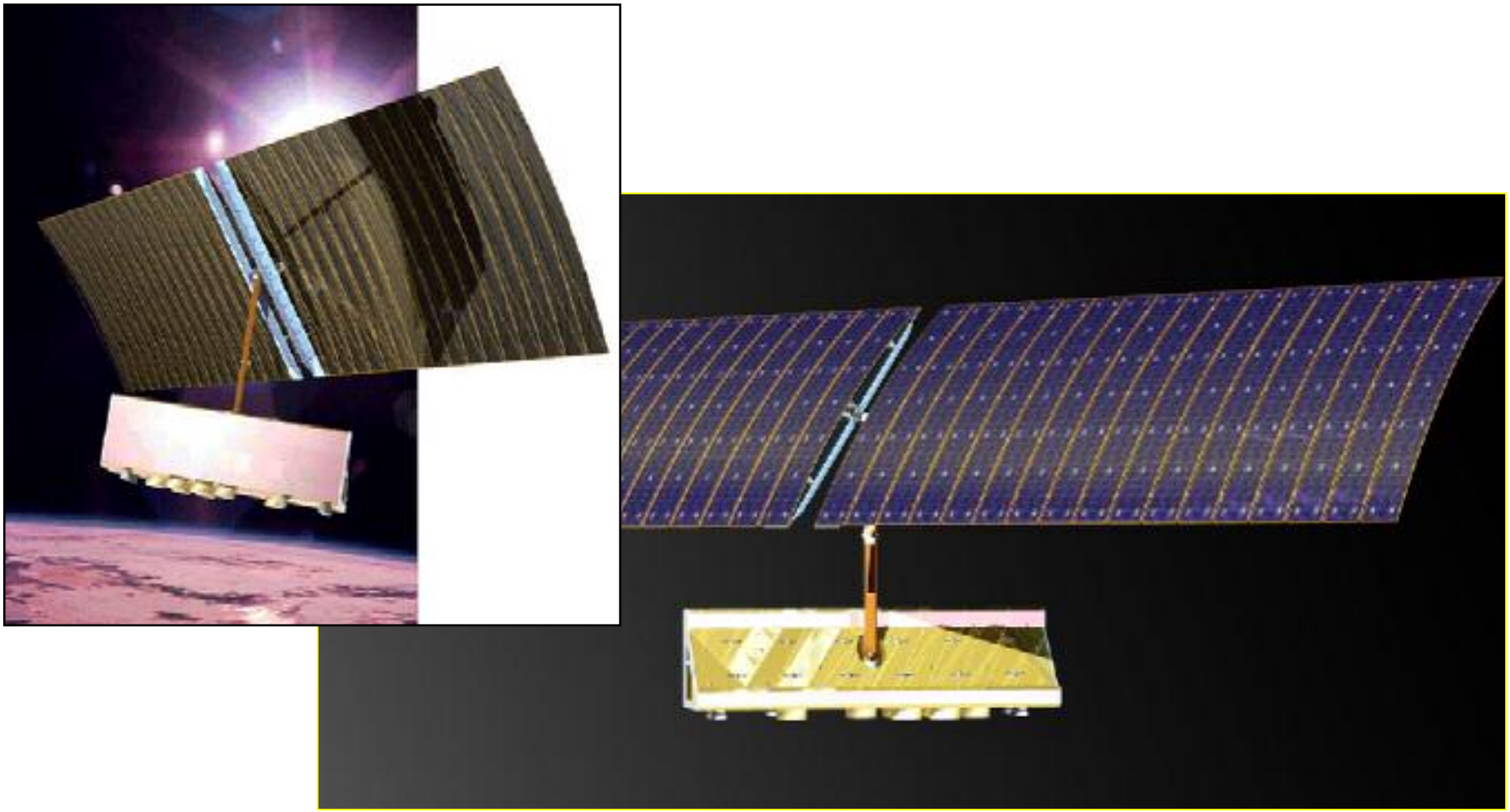
Solar Panel Deployment

- Demo project for Fokker Space in Leiden
- Evaluation project for new Solar Arrays
  - Feasibility studies for constellation
  - Evaluate future CAE tools

- Solar array requirements
  - High power output, small stowed volume

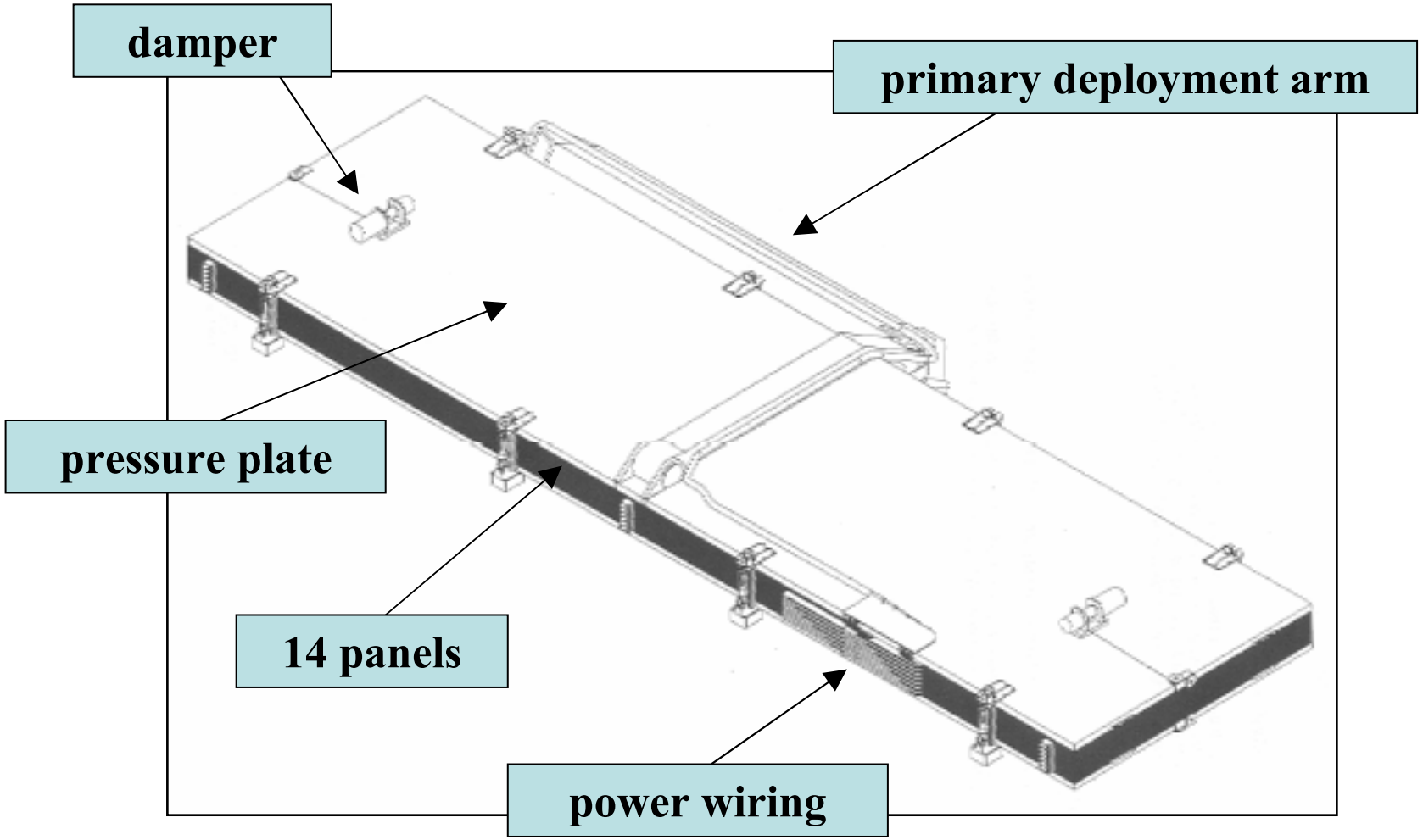
  ….

Curwin Solar panel system



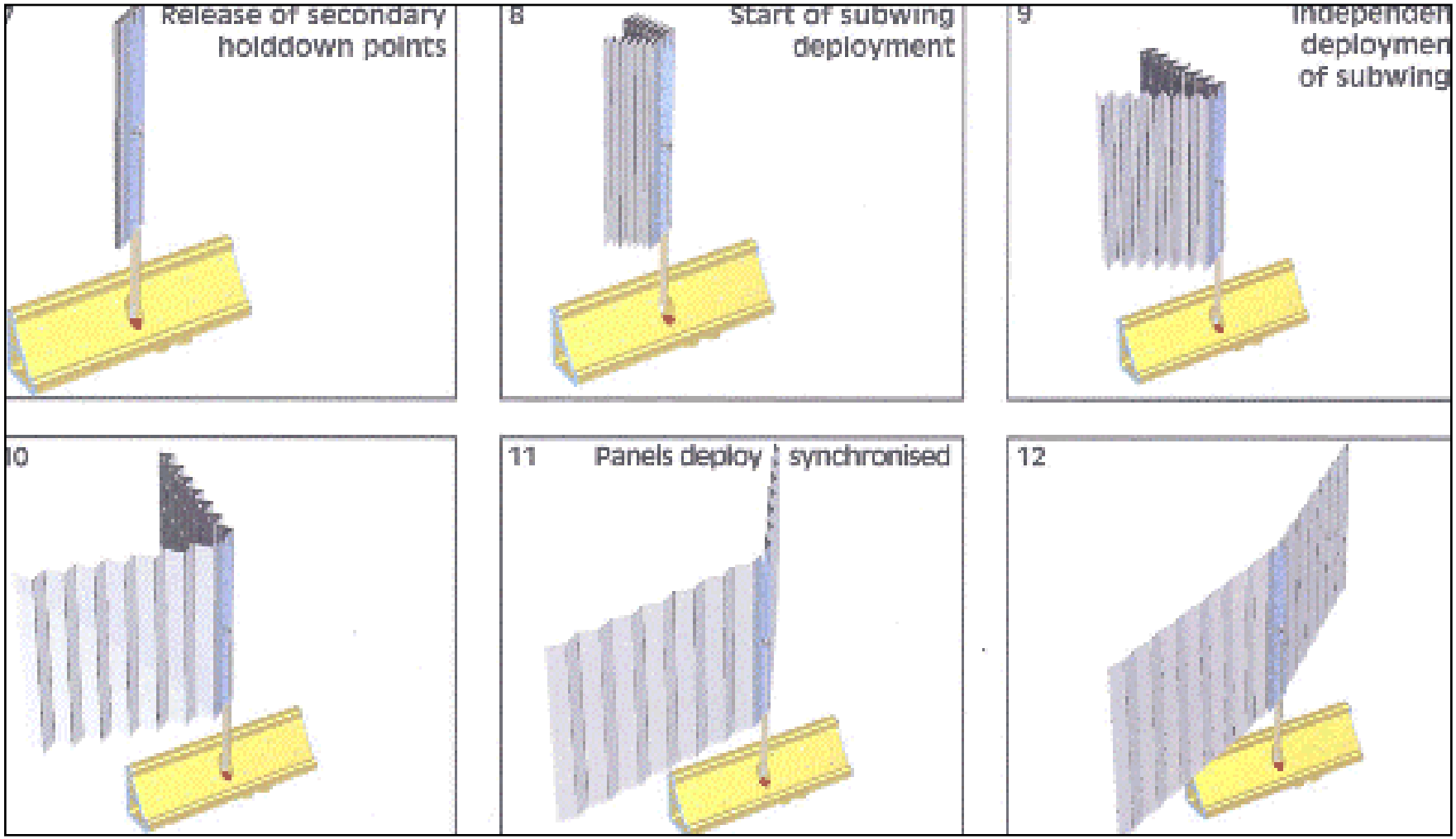
Solar Panel Deployment

Solar array in stowed situation



Solar Panel Deployment

Secondary deployment



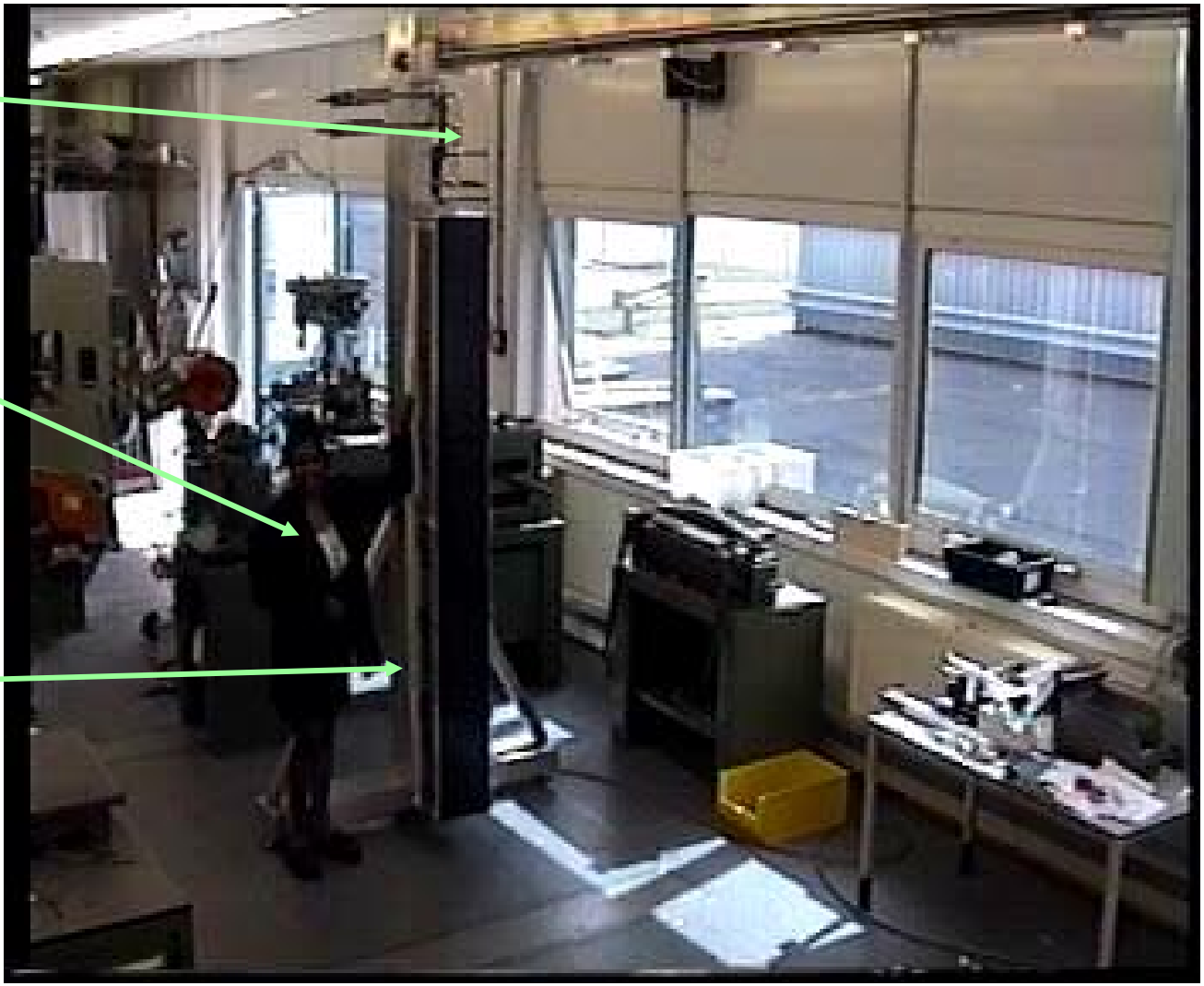
Solar Panel Deployment

Measurement results

Ground Support Equipment

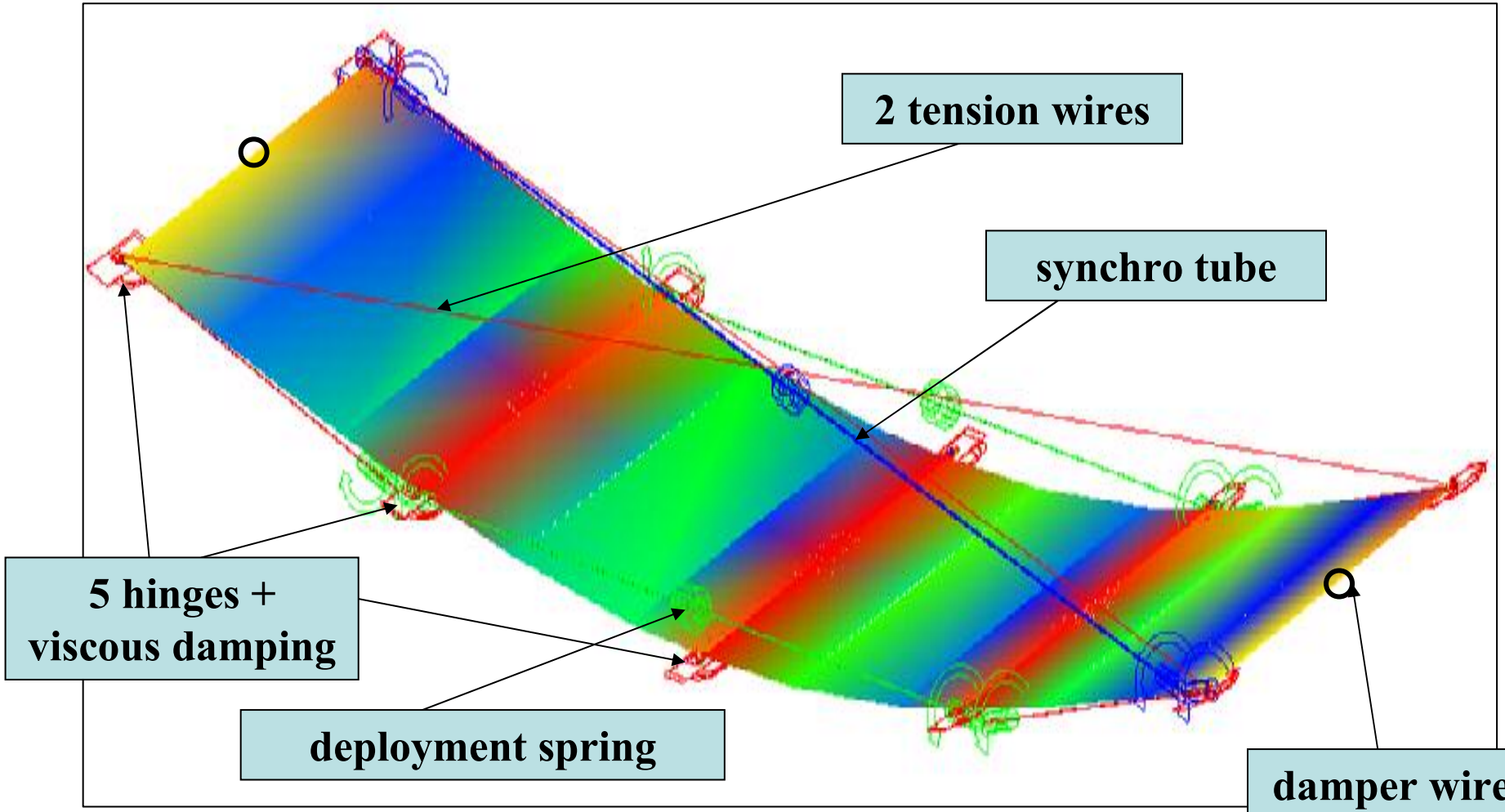
Fokker employee

Curwin solar panels

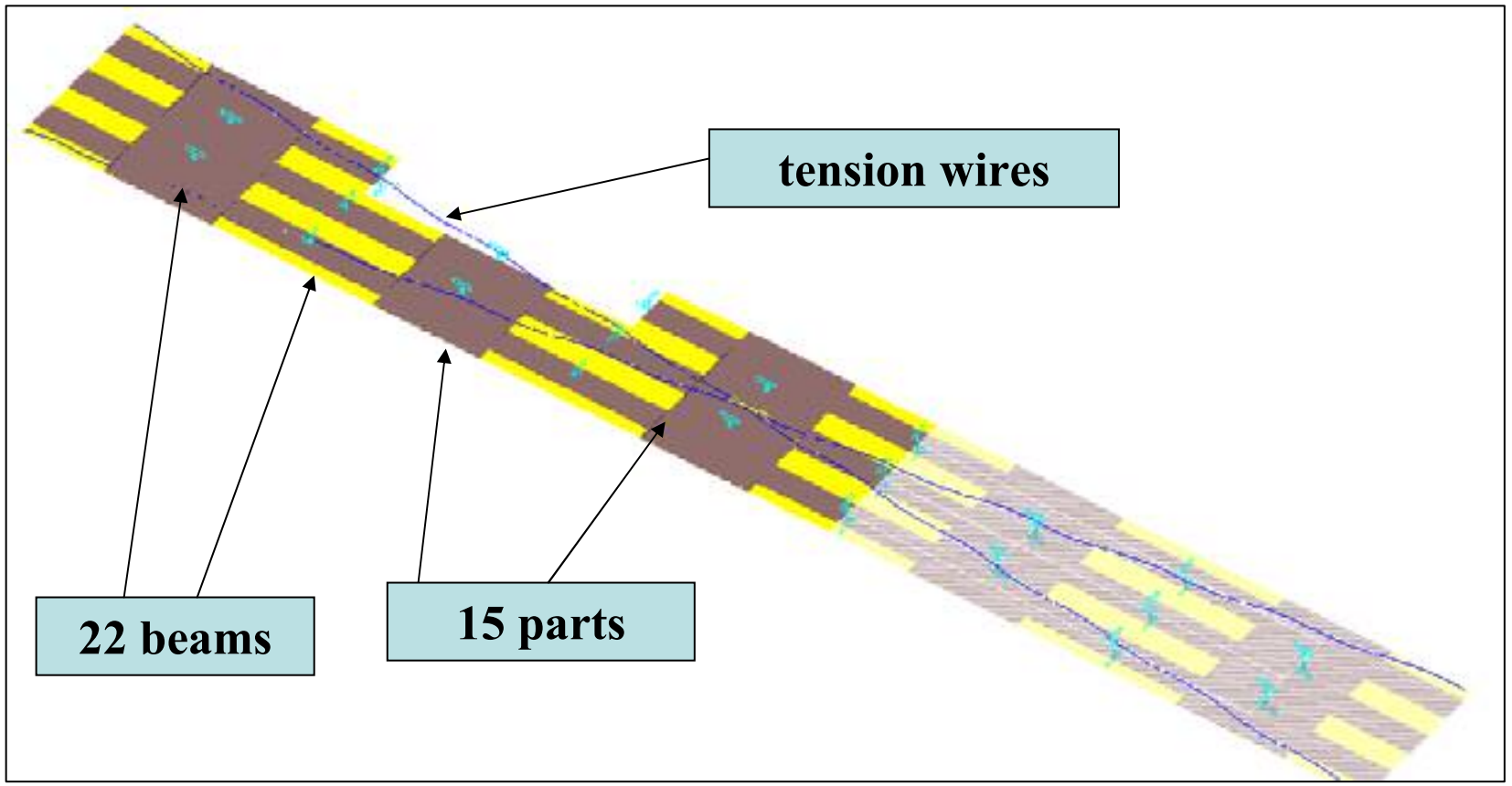


Solar Panel Deployment

Flex model components



Discrete flexible panel model



Discrete flexible plate macro

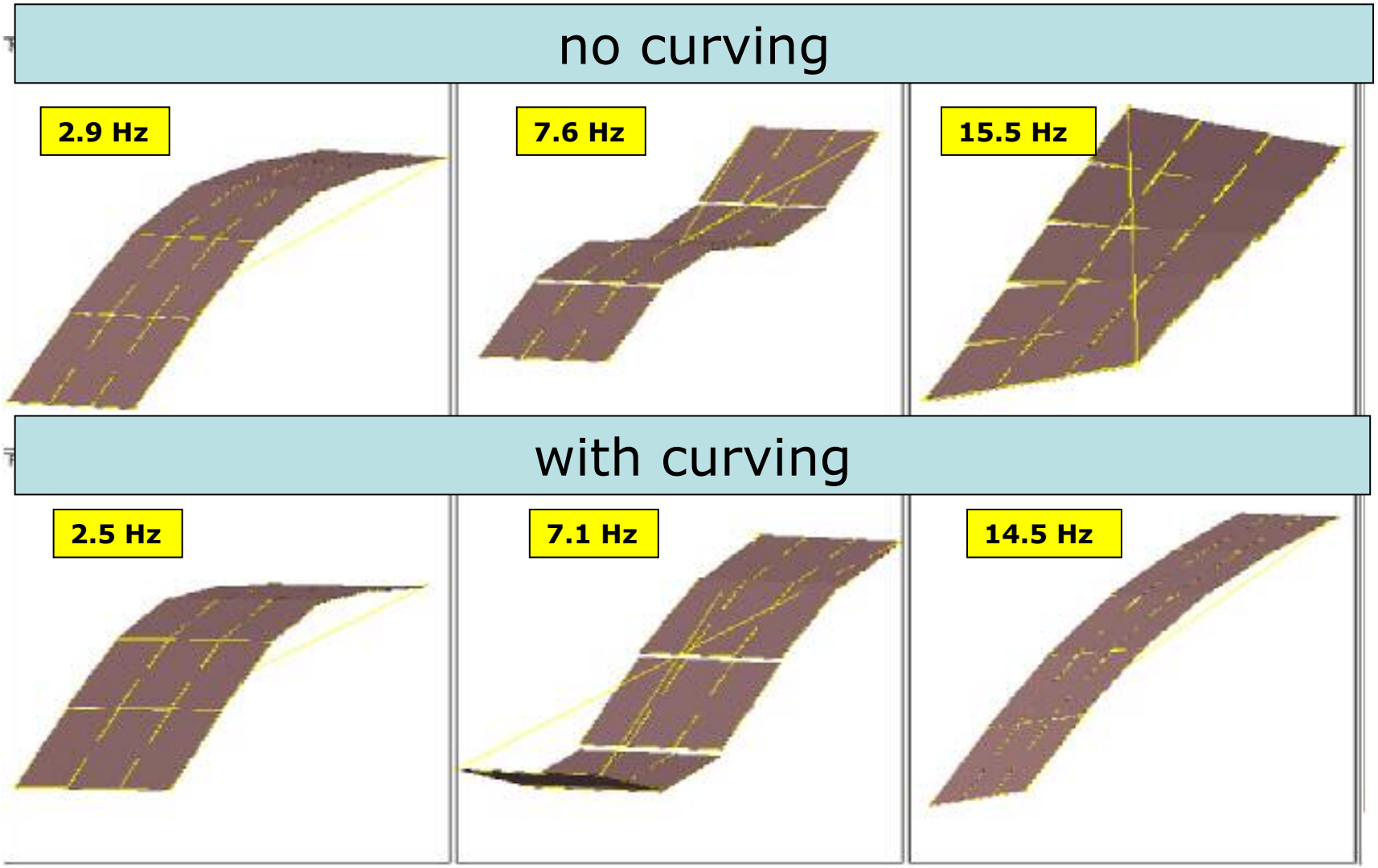
15 parts: 90 DOF

Variable level of detail

Physical properties

Solar Panel Deployment

Discrete flexibility: modes 1 - 3

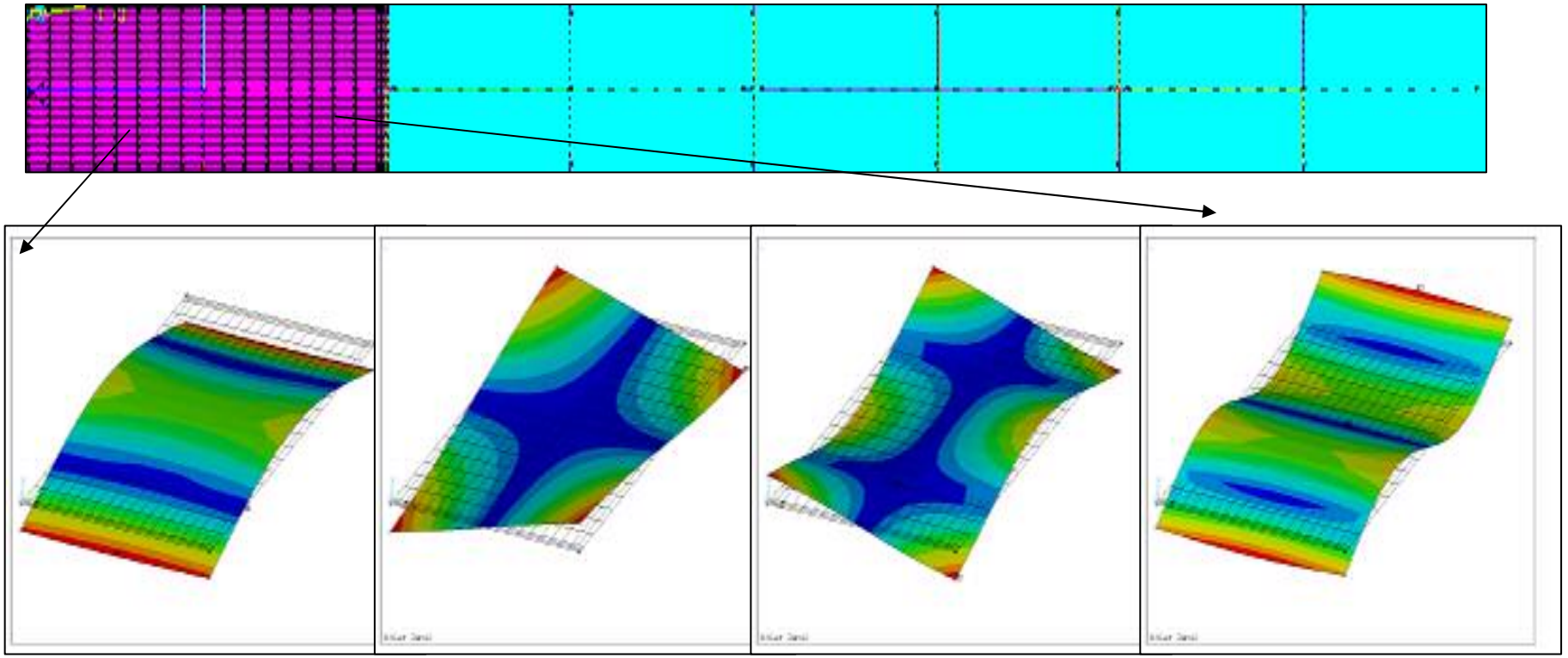


Solar Panel Deployment

Panel model II: modal flexibility

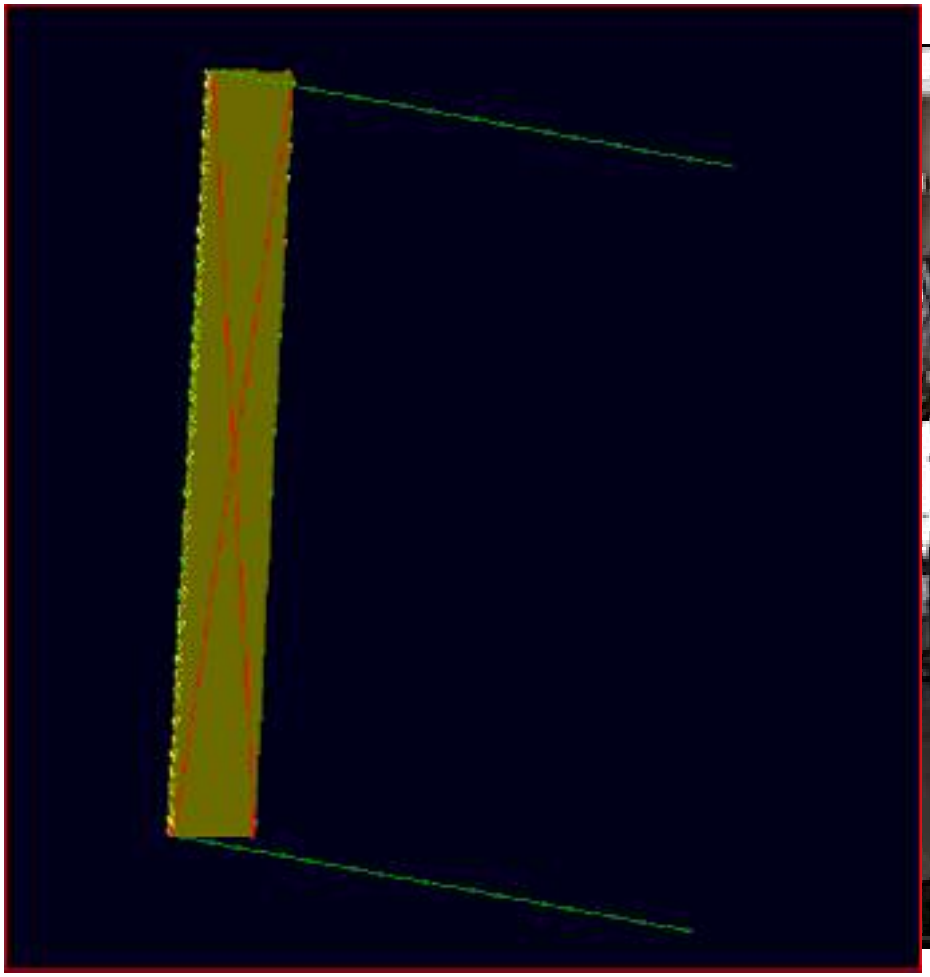
ANSYS FEM Model

Substructure of ¼ panel, each 6 master nodes, 46 modes



Modes 1-4 (44.8, 54.5, 118 and 123 Hz)

ADAMS vs. measurements



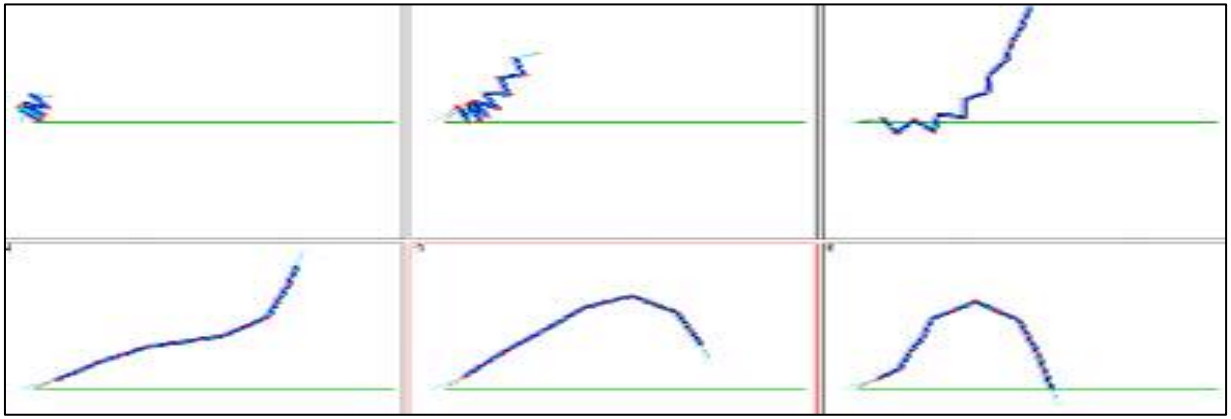
→ Good correlation

Solar Panel Deployment

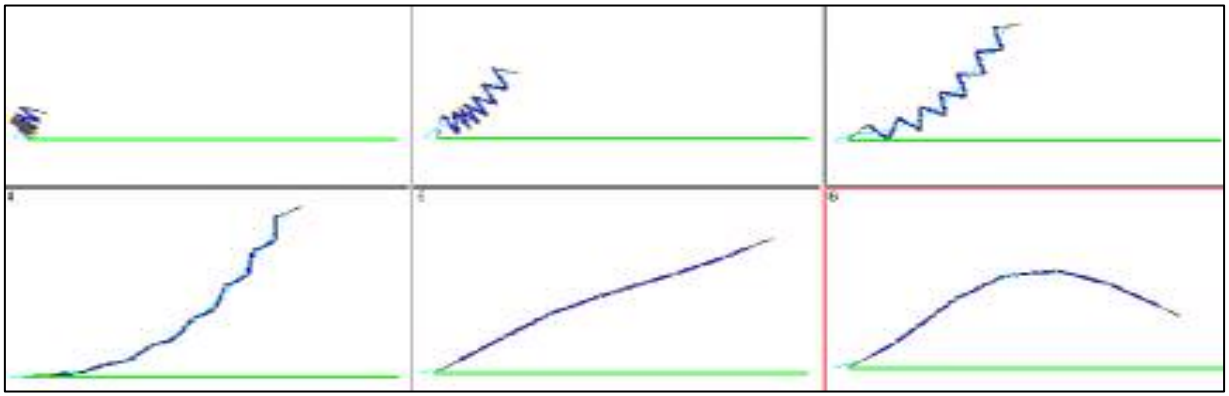
Parameter optimisation

- Parameter analysis using 2-D Models
- Verification using models with curving

180° default case



+ viscous damping



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