HPC-Cloud-based design of high-pressure vessels
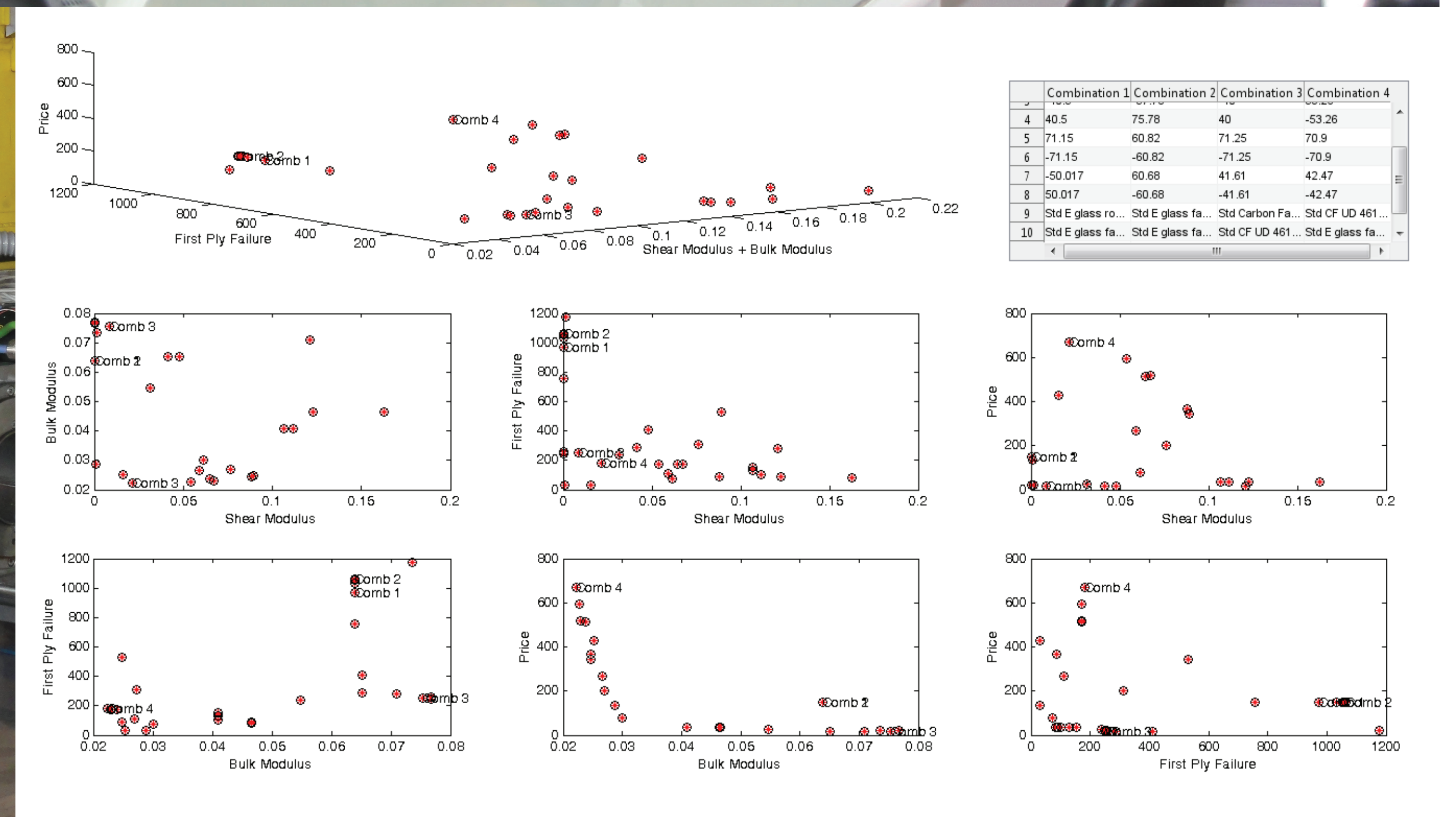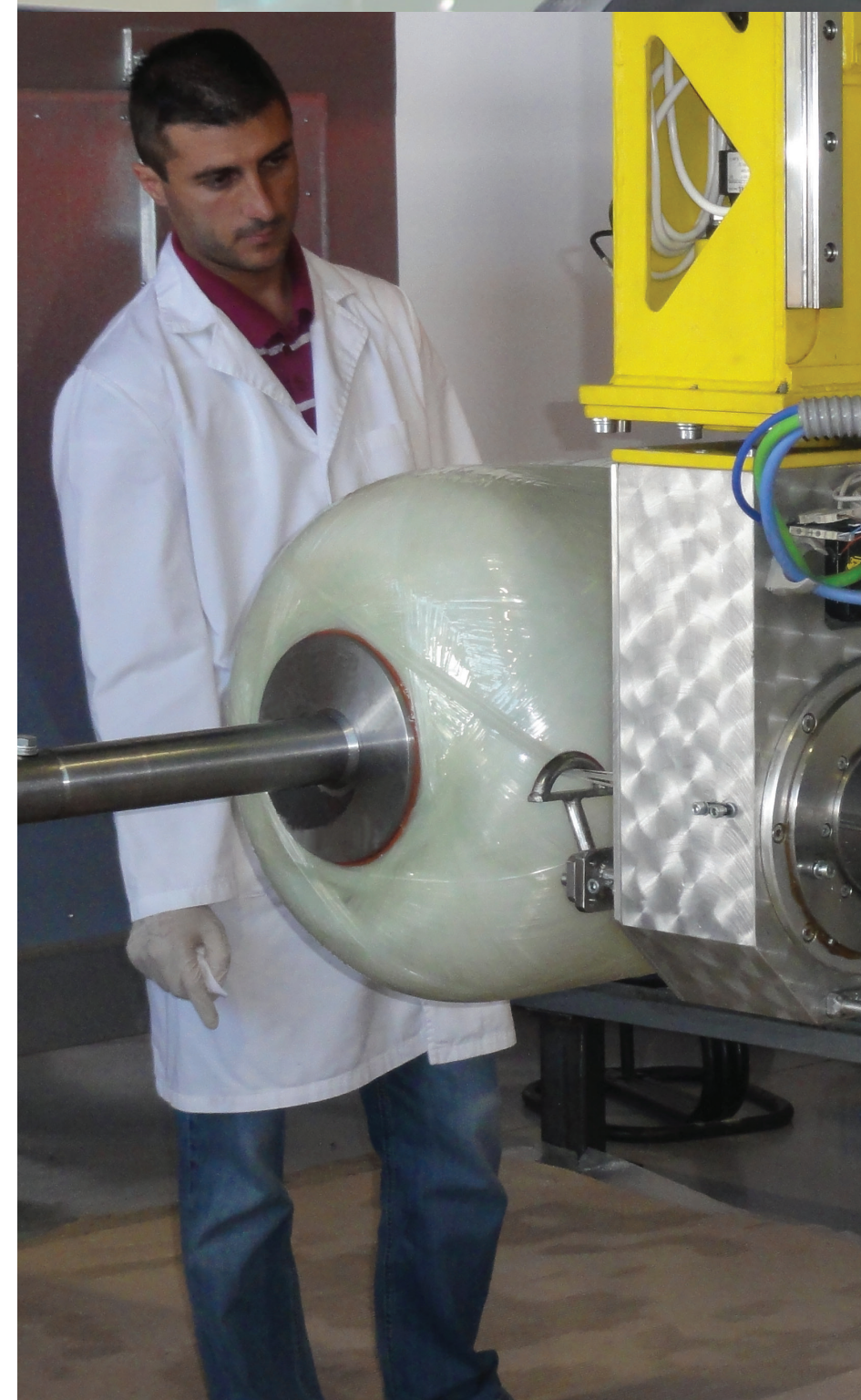
⚙ The Challenge

The goal was to improve Mikrosam's capability to satisfy the principal ISO 11439 standard and the ECE R 110 normative for Gas cylinders by **developing a model for the design and simulation** of composite laminates that could be implemented on an HPC system and obtain **accurate results in an acceptable time**.

💡 The Solution

- A computer model that was adapted to be run on an HPC system was developed, to design composite laminates and simulate their properties.
- HPC-based simulations **reduce computation time and the number of physical tests**, which need to be made in the design of composite laminates.

✅ The Benefits

- For each filament winding machine used in the production of high-pressure vessels, **different combinations** of materials and winding angles for the composite, **need to be considered**.
- With the simulation code developed in this case study it is possible to shorten the design time and to reduce the number of physical tests and prototyping costs.
- The experience gained in this experiment together with reduced production costs for both Mikrosam and its customers constitutes **a base for further growth of the company** and the resultant creation of new jobs.

Organisations Involved

End User:

MIKROSAM
CONTROL·AUTOMATION·ROBOTICS
A C A D E M Y

HPC Provider:

ARCTUR

ff FORTISSIMO

European Commission

I4MS