Distributed systems with symmetries: general properties arising from an application

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The discussion in this talk follows from a recent contract to study control strategies for the segmented primary mirror of the European Extremely Large Telescope (E-ELT), in a comprehensive realistic setting. The talk starts by describing this application and naturally relates it to a distributed systems approach. Then it describes several specific issues and solutions for the control of the E-ELT; among others, global and local control approaches are compared. Relevant symmetries are mentioned along the way. Finally, some general ideas for the study of distributed systems with symmetries are derived from observations on the application. They include a link with partial differential equations and fundamental robustness issues.

The combination of interaction graphs, control decisions based on local information estimates, and general system properties could lead to discussions involving diversified interests of the research unit.