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Fundamentals of Control Theory and Wavefront Reconstruction

Tuesday 1 October 2024 09:00 (1h 30m)

This lecture provides an introduction to wavefront reconstruction and dynamic control in adaptive optics (AO) systems. We will explore the key principles, including the application of inverse-problem theory to wavefront reconstruction and optimal/sub-optimal control to real-time DM correction, such as feedback loops, control matrix techniques, and optimization strategies to compensate for atmospheric turbulence. The focus will be on practical algorithms including examples and test cases. By the end of the lecture, participants will gain a foundational understanding of how adaptive optics systems are designed and controlled to achieve high-resolution imaging in ground-based telescopes.

Presenter: Dr CORREIA, Carlos (Universidade do Porto)

Session Classification: Class