
Model Based Systems Engineering for the Gemini North Adaptive Optics Bench Phase A

Michael Goodwin^{*†}, Thierry Fusco , Nicolas Vedrenne , Jean-Francois Sauvage , Romain Fetick , Cedric Taissir Heritier , Benoit Neichel , Pierre Jouve , Carlos Correia , Piero Bruno , Julien Charton , Alexis Jarry , Sebastian Ignaztak , Jon Lawrence , Tiger Wang , Jessica Zheng , Tobias Feger , Helen McGregor , Tim Chin , Lew Waller , Tony Farrell , Francois Rigaut , Andrew Rakich , and Sylvain Cetre

¹Australian Astronomical Optics - Macquarie, Macquarie University, Sydney, NSW, 2109, Australia. – Australia

Abstract

The use of model-based systems engineering (henceforth MBSE) can help offset some of the technical challenges associated with the realisation of adaptive optics systems for future extremely large aperture telescopes (ELTs). The establishment and maintenance of the single version of the truth (i.e. the model) for a large and complex project, increases the likelihood of project success. To this extent, the AAO-Macquarie and collaborators (ONERA/LAM/ALPAO) have adopted an MBSE approach for the proposed Gemini North Adaptive Optics Bench Phase A (AURA project). We use architecture representations and system decompositions using the SysML elements, both functional and structural, with diagrams, allowing each project stakeholder to focus on aspects of the problem. The SysML elements can be traced to requirements and other elements, making it easier to assess risk and prevent costly mistakes discovered during development and operational phases. Therefore, the knowledge gained being beneficial to the system modelling of future adaptive optics systems.

Keywords: model, based systems engineering, system engineering, MBSE, SysML, adaptive optics bench

^{*}Speaker

[†]Corresponding author: michael.goodwin@mq.edu.au