

# LLAMAS: An acquisition, control and monitoring software for LLAMA

GIMÉNEZ DE CASTRO, C.G.<sup>1</sup>, LARRARTE, J.J.<sup>2</sup>, IBSEN, J.<sup>3</sup>, ABRAHAM, Z.<sup>4</sup>,  
BAREILLES, F.<sup>2</sup>, HAUSCARRIAGA F.<sup>2</sup>, STRAUSS, C.<sup>5</sup>, AND ZANELLA, D.<sup>4</sup>

<sup>1</sup>*Presbyterian Mackenzie University, Brazil*

<sup>2</sup>*Argentinian Institute of Radio Astronomy, Argentina*

<sup>3</sup>*Atacama Large Millimeter Array, Chile*

<sup>4</sup>*Institute of Astronomy and Geophysics, USP, Brazil*

<sup>5</sup>*National Institute for Space Research, Brazil*

May 5, 2015

## Abstract

The Large Latin American Millimeter Array is a 12-m Nasmyth antenna to be installed at 4850 m above sea level in the Argentinian Atacama Region. LLAMA will operate both in single dish mode and as a VLBI station. LLAMAS is the software, under development, that will acquire the data from the receivers, control the different devices and monitor the safe functioning of the sub-parts. It is based on the ALMA Common Software (ACS), that implements the concept of *containers* and distributed *component* objects. It is programmed in JAVA, C++ and Python, and uses the Common Object Request Broker Architecture (CORBA) infrastructure to exchange messages between the subsystems. LLAMAS must be as heterogeneous as the telescope operation: single dish observing modes with simultaneous readouts from single-pixel receivers, and two different polarization channels in continuum (*total-power*) or spectral mode, single-dish from multi-pixel cameras, and coordinated interferometric observations as a VLBI station. Since the antenna will be located at a very high altitude, the control room will be at a safer lower place 20 km away, and therefore the operation will be remote. Moreover, the high altitude requires the use of disk-less computers and the immediate data transfer to the control room through a fast connection link. It is also envisaged a Web based observing proposal submission and data querying system for the astronomers, making the whole observing process world wide available. In this work we present the conceptual software design of the observation cycle, that we call *from the Astronomer to the Astronomer* (A<sup>2</sup>A), and we describe the different subsystems needed to accomplish this goal.