

The ALMA Design Reference Science Plan (DRSP)

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What is the Design Reference Science Plan?

The ALMA Design Reference Science Plan (DRSP) grew out of the need to have a detailed view of what the first 3–4 years of full ALMA operations will look like. Based on the projects that astronomers will want to carry out with high priority, ALMA's development can be optimised. For example, ALMA's specifications can be tested for realistic scenarios, or plans can be made regarding which configurations or frequency bands to commission with high priority. The DRSP can also be used to determine observing strategies, data rates, and use-cases. Finally, and most crucially, the impact on the science (and ALMA's primary Science Drivers) from any changes in specifications can be quantitatively assessed.

What the DRSP is not

The DRSP is not a set of observing proposals. Although they look like proposals, they will not form the basis of any kind of ALMA programme, and do not imply any claims on particular observations. The DRSP is also not set in stone. Science priorities will change over time, and

the DRSP is only the current reflection of what the community wants to do with ALMA.

The current DRSP

In total, by December 2003 128 DRSP projects were submitted for a total of ~ 25 000 hours, distributed over four main science areas: Galaxies and Cosmology (41 % of time), Star and Planet Formation (35 %), Stars and their Evolution (10 %), and Solar System (14 %). These projects were written by more than 75 astronomers, and 'peer reviewed'. The results are collated at a web site (see address below).

From the DRSP, one can, for example, learn that the foreseen use of receiver bands (3/6/7/9 = 20%/30%/37%/13%) is roughly consistent with expected weather statistics. While band 6 is heavily used for spectral-line work, bands 7 and 9 are the most requested for continuum observations, especially for extragalactic targets. Roughly 10% of the proposals employ the total-power capability of the array.

How to use the DRSP

The DRSP can be accessed at the web site given below. The individual projects can be downloaded together with their review reports. Spreadsheets are also available with overviews of all programme statistics. These have been used, e.g., to get estimates of the calibration requirements, or to assess the impact of various re-baselining decisions. The DRSP is a valuable resource for anyone wishing to get a realistic and detailed view of ALMA's capabilities and foreseen use.

The DRSP is a living document

The DRSP can only be an accurate reflection of future ALMA use if it is continuously updated. New projects can be added at all times, and existing projects can be augmented as the science questions evolve or instrument specifications change. This evolving aspect of the DRSP is crucial, because planning decisions are based on the DRSP.

The DRSP is being maintained for the ALMA Science IPT by Michiel Hogerheijde, and suggestions for additional DRSP projects can be e-mailed to him at any time (michiel@strw.leidenuniv.nl).

For more information, go to <http://www.strw.leidenuniv.nl/~alma/drsp.html>

Photo: H. H. Hever, ESO



A view of Chajnantor and APEX.