



ALMA Change Request

CR#: ALMA-90.xx.xx.xx-nnnL-CRE

Title: Request to extend upper frequency limit on Band 7

.....
.....
.....

(To be completed by CR Submitter/Initiator)

Description of change: (detailed description of change proposed)

The upper frequency edge of Band 7 is now 370 GHz. An increase of this edge to 373 GHz is requested.

Justification/Reasons for change: (justify why change is necessary or beneficial)

A line of the principal ion-molecule chemistry ion H_2D^+ at 372.421 GHz was recently detected in an interstellar cloud by Stark et al. (ApJ 521, L67). The non-deuterated form of this ion has no rotational transitions owing to its symmetry and is unobservable in very cold interstellar clouds where many molecules have become depleted onto grains. The molecule is destroyed through the interactions with neutrals which initiate the rich observed cloud chemistry. In regions where neutrals are depleted, this molecule offers the only spectroscopic probe. Those regions are cold, where deuterium enrichment is high. Low luminosity stars and planets form in these cold depleted regions; investigations of the mechanisms of formation of stars and planets is a primary ALMA goal. As perhaps the only available probe of kinematics in these regions, it is essential that ALMA be capable of observing this line of H_2D^+ .

Additional information in attached documents: (refer to and attach to this document) or (reference as Doc# aaaa-xx.xx.xx.xx-nnnL-ccc andTitle)

Impact: Specifications Science Cost Schedule Safety Technical Other (specify):.....

Description of impact: (briefly describe type and nature of impact)

This change may affect receiver design; the poor atmospheric transparency in this spectral region limits sensitivity. LO design will be affected also, particularly if the selected IF for band 7 is not 8 GHz.

Affected products to be modified: (PT#) (Product Name) (Serial#) (use if applicable)

Affected documents to be revised: (Doc#) (Title) (by Whom) (When)

ALMA Memo No. 213 Frequency Band Considerations and Recommendations by Wootten et al. May 1998; also Front End Specifications ver 2.0 by Wild and Payne 4 May 2001.

Remarks: (specify other documents or any special circumstances related to proposed change)

This change was requested by the ASAC; see Report to the ACC presented Oct 2000 Sec 6.1 Table 1 'Science Drivers Band 7'

Suggested CC for technical input: (list names and email of people who you think might have technical input)

Wolfgang Wild, Charles Cunningham, Stephane Claude, Larry D'Addario,

Suggested CC for information: (list names and email of people who you think might want to be informed)

guillote@iram.fr, jpayne@nrao.edu, Charles.Cunningham@nrc.ca, ghtan@eso.org, pgray@nrao.edu

Priority/Significance: Urgent/Critical Important Standard Non-Urgent/Record

Date Submitted: 2002-Jun-11

Date Decision Required: 20xx-xx-xx

CR Initiator: Al Wootten NRAO awootten@nrao.edu (434) 296-0329

(To be completed by CCB)

| | | | |
|---|---------|-------------------------------------|---------|
| <input type="checkbox"/> MAJOR or <input type="checkbox"/> MINOR Reason: (reason why assessed major or minor) | | | |
| CCB Secretary: (signature) | (date) | CCB Chair: (signature) | (date) |
| CCB#1: (signature) | (date) | CCB#2 : (signature) | (date) |
| CCB#3: (signature) | (date) | CCB#4 : (signature) | (date) |
| CCB#5: (signature) | (date) | CCB#6 : (signature) | (date) |
| Project Manger: (signature) | (date) | Project Director (signature) | (date) |
| <input type="checkbox"/> APPROVED <input type="checkbox"/> REJECTED Reason: (brief description of reasons for decision) | | | |