



Observing Application

Date : Sep, 30 2010
 Proposal ID : VLA/10B-245
 Legacy ID : AL759
 PI : jean-francois Lestrade
 Type : Rapid Response -
 Exploratory Time
 Category : Extragalactic
 Total Time : 4.0

Exploratory project : Properties of the Bright SMG MM1842 in the Early Universe

Abstract:

Serendipitously Lestrade et al (2010) have discovered a rare, bright SMG with a flux density of 30 mJy at 1.2mm and measured $z=3.92960$. MM18423+5938 is yet the brightest SMG with known z . We derive the FIR luminosity $4.8 \cdot 10^{14} L_{\odot}$ and mass $4.0 \cdot 10^9 M_{\odot}$ for its dust, the star formation SFR $8.3 \cdot 10^4 M_{\odot}/yr$, and the H₂ mass of up to $1.1 \cdot 10^{12} M_{\odot}$. These parameters are very high, for instance the SFR is ~ 50 times higher than expected for SMG's. The most plausible scenario is gravitational lensing (magnification factor m), although no foreground lens has been identified yet. We are initiating an in-depth multi-wavelength study of the physical properties of MM1842 because of its potentially major implication for massive galaxy formation at very early cosmic epoch. We are submitting an exploratory project to take advantage of the current C (CnB) configuration to probe the excitation conditions and morphology of MM1842 at moderate angular resolution by observing its CO(1-0) and CO(2-1) line emissions, in order to choose the most appropriate configuration for subsequent deep imaging.

Authors:

Name	Institution	Email	Status
jean-francois Lestrade	Paris, Observatoire de	jean-francois.lestrade@obspm.fr	
Francoise Combes	Paris, Observatoire de	francoise.combes@obspm.fr	
Philippe SALOME	Institut de Radio Astronomie Millimerique	salome@iram.fr	
Chris Carilli	National Radio Astronomy Observatory	ccarilli@nrao.edu	
Alain Omont	Institut d' Astrophysique de Paris	omont@iap.fr	
Frank Bertoldi	Universität Bonn	bertoldi@astro.uni-bonn.de	
Roberto Neri	Institut de Radio Astronomie Millimerique	neri@iram.fr	
Melanie Krips	Harvard-Smithsonian Center for Astrophysics	mkrips@cfa.harvard.edu	
Jean-Paul, Kneib	Marseille-Provence, L'Observatoire Astronomique de	jeanpaul.kneib@gmail.com	
David Wilner	Harvard-Smithsonian Center for Astrophysics	dwilner@cfa.harvard.edu	

Principal Investigator: jean-francois Lestrade
 Contact: jean-francois Lestrade
 Telephone: +33 01 40 51 21 37
 Email: jean-francois.lestrade@obspm.fr

Related proposals:

none

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
C_Q_band_dual_pol	C	Q Band 0.7 cm 40000 - 50000 MHz WIDAR OSRO2: 1 Subband/Dual polz	Rest frequencies: 230538.0000 MHz Bandwidth: 128.0 MHz No. of Channels: 256 Poln. products: 2.0 Channel Width: 500.0 kHz
C_K_band_dual_pol	C	K Band 1.3 cm 18000 - 26500 MHz WIDAR OSRO2: 1 Subband/Dual polz	Rest frequencies: 115271.2018 MHz Bandwidth: 128.0 MHz No. of Channels: 256 Poln. products: 2.0 Channel Width: 500.0 kHz

Sources:

Name	Position		Velocity		Group
MM18423+5938	Coordinate System	Equatorial	Convention	Redshift	SMG
	Equinox	J2000			
	Right Ascension	18:42:22.5 00:00:00.26	Ref. Frame	LSRK	
	Declination	+59:38:30.0 00:00:02.0	Redshift	3.93	

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
Q band	2.00	1	0 day	00:00:00	24:00:00	35
K band	2.00	1	0 day	00:00:00	24:00:00	35

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
Q band	MM18423+5938	C_Q_band_dual_pol	2.0 hour	0.4 mJy/bm	
K band	MM18423+5938	C_K_band_dual_pol	2.0 hour	0.2 mJy/bm	

Present for observation: no

Staff support: Consultation

Plan of Dissertation: no