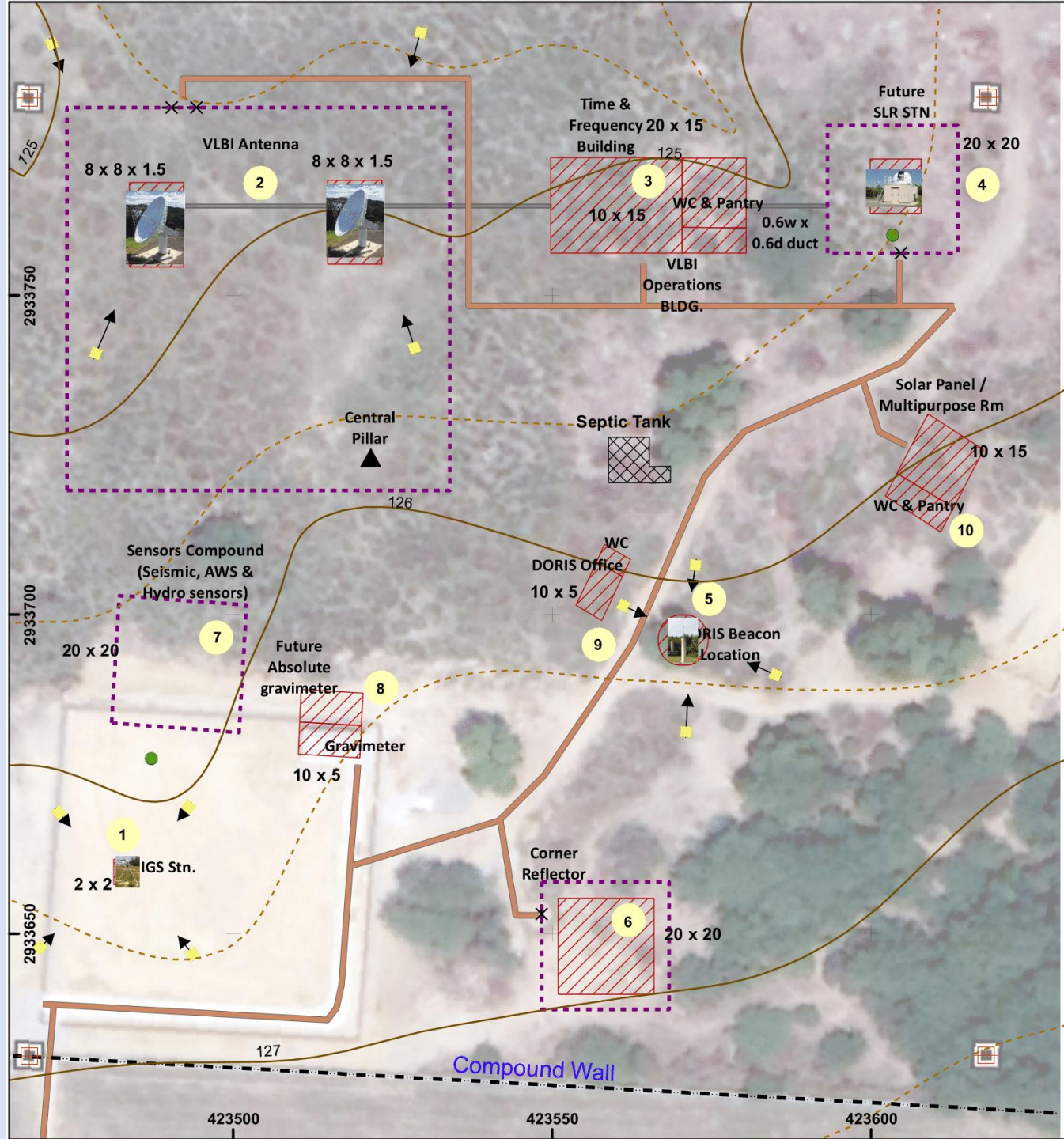


Establishment of State-of-the-Art Geodesy Village in India: Current status and Outlook

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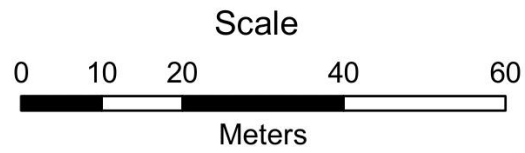


GEODESY VILLAGE MAP



LEGEND

-  Buildings
-  Fence
-  Septic Tank
-  Roads
-  Duct Pipe
-  Borehole
-  Central Pillar
-  Boundary points
-  LinkID
-  Check Points

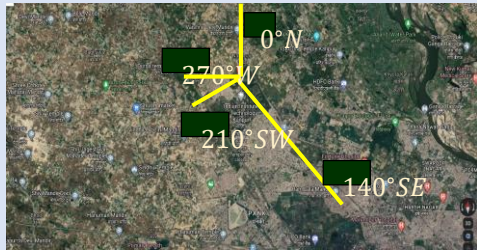
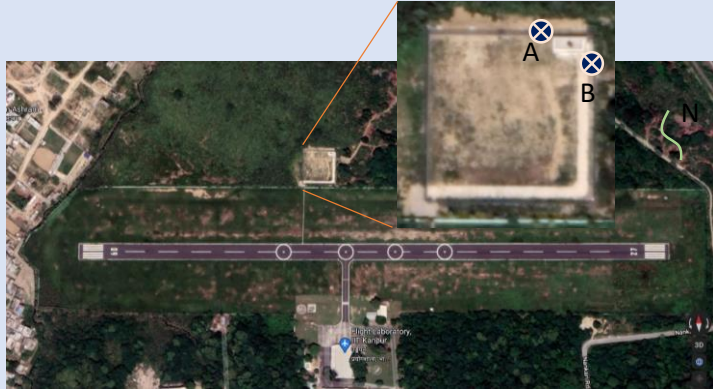


Projection WGS 84 UTM Zone 44
Units Meters
Contour Intreval 0.5 m

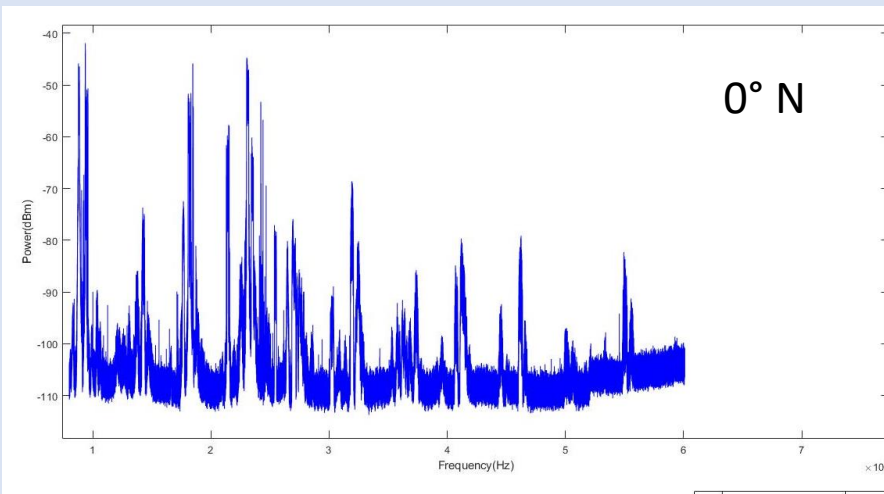
Geodetic facilities

Facilities	Installed now	Project Planning Phase	Discussion Phase
Permanent GNSS Station			
Very Long Baseline Interferometry (VLBI)			
Satellite Laser Ranging (SLR)			
Doppler Orbitography and Radio-positioning Integrated by Satellite (DORIS)			
Automatic Weather Station			
Time Laboratory			
Relative Gravimeter			
Absolute Gravimeter			

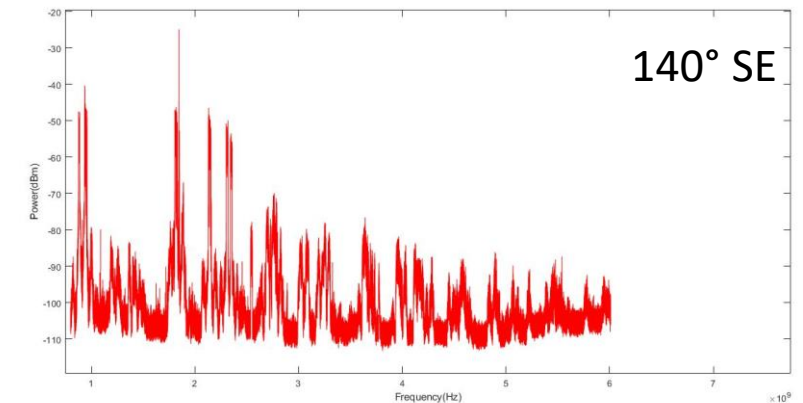
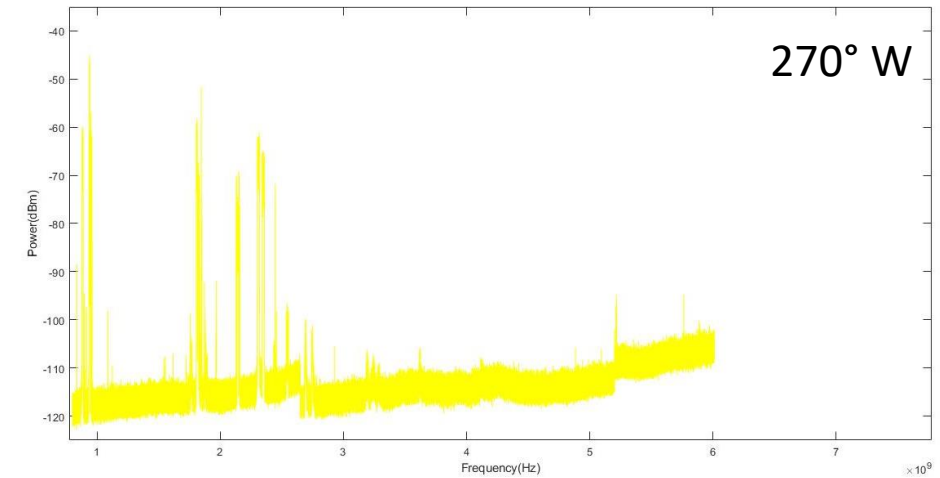
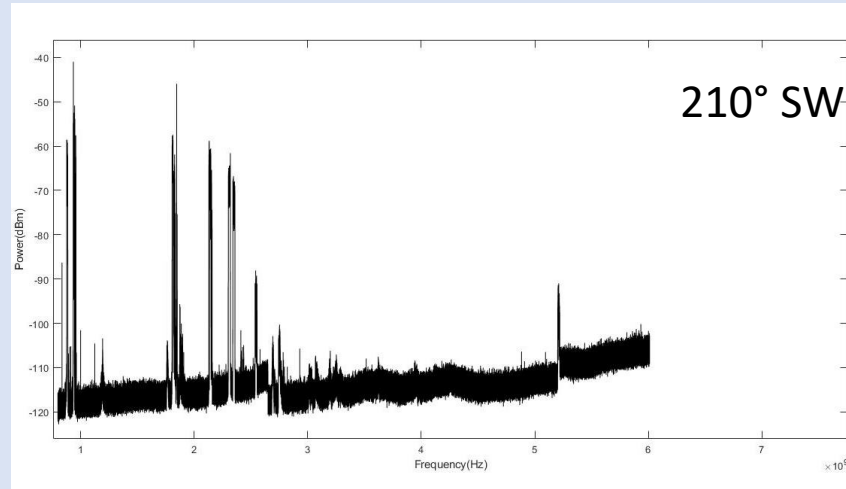
Site Investigation



RFI Surveys are very important for the site as most of the geodetic techniques on site will take radio frequencies as observations and therefore, the site should be ideal for such observations. This will also help to plan any RFI blockers or special filters in receivers, if the spectrum is noisy. Along with RFI, Geotechnical survey was also performed.



The following figures show RFI survey performed at the site. For only 0-6 GHz, the survey was performed till now.



VLBI station

A twin telescope is planned at the geodesy village with –

- 13.2m radio telescope
- 2-14 GHz broadband receiver
- DBBC3
- Mark 6 recorder
- Correlation facilities
- Data Analysis facilities
- Time Laboratory

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WG1: Site Investigation

WG2: Infrastructure/ Maintenance

WG3: VGOS Radio Telescope

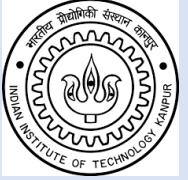
WG4: VGOS Receiver

WG5: Digital Backend

WG7: Data Recorder and Correlation

WG6: Time and Frequency

WG8: Observations, Data Analysis and Scheduling



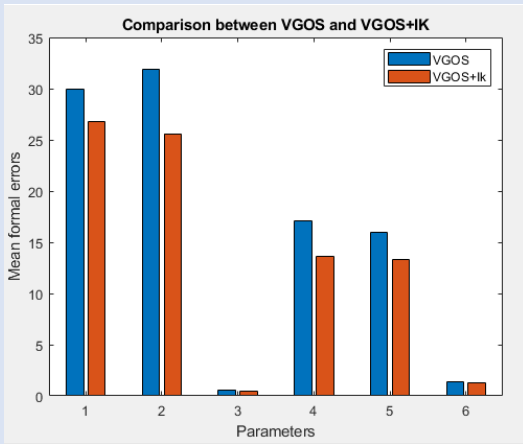
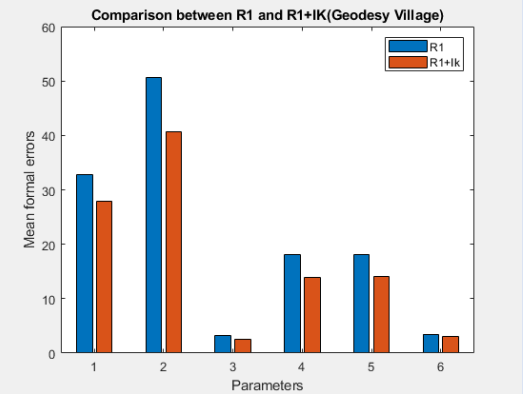
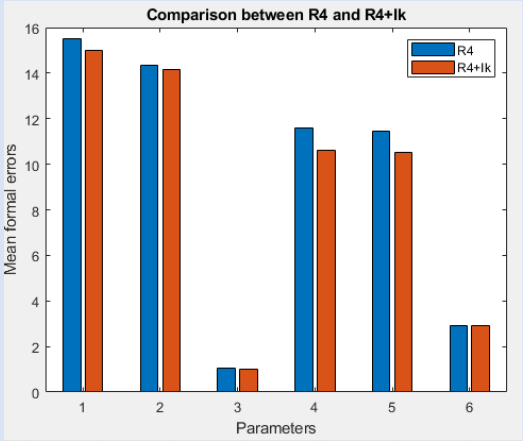
Impact of new VLBI station at Geodesy Village

Improvement Chart

Station	Obs	Xpo(1)	Ypo(2)	dUT1(3)	NUTX(4)	NUTY(5)	3D(6)
R4938	13220	15.53	14.33	1.03	11.58	11.45	2.92
+IK	+3400	3.54%	1.11%	2.91%	8.12%	8.12%	0.68%

Station	Obs	Xpo(1)	Ypo(2)	dUT1(3)	NUTX(4)	NUTY(5)	3D(6)
R1983	14887	32.79	50.60	3.17	18.02	18.15	3.47
+IK	+3839	14.69%	19.59%	19.48%	23.21%	22.59%	1.63%

Station	Obs	Xpo(1)	Ypo(2)	dUT1(3)	NUTX(4)	NUTY(5)	3D(6)
VO0345	19203	29.93	31.91	0.59	17.11	15.92	1.33
+IK	+1924	10.69%	19.79%	22.12%	20.50%	16.57%	1.48%



Time Laboratory

The timing laboratory at Geodesy Village shall not only support time management capabilities for the VLBI facility but shall also serve as an alternative timekeeping station in the country where the time descriptors shall be shared with the other prominent research and development organizations within the country.

Two timescales shall be generated from an ensemble of 3 Active Hydrogen Maser (AHM) and 2 Passive Hydrogen Maser (PHM).

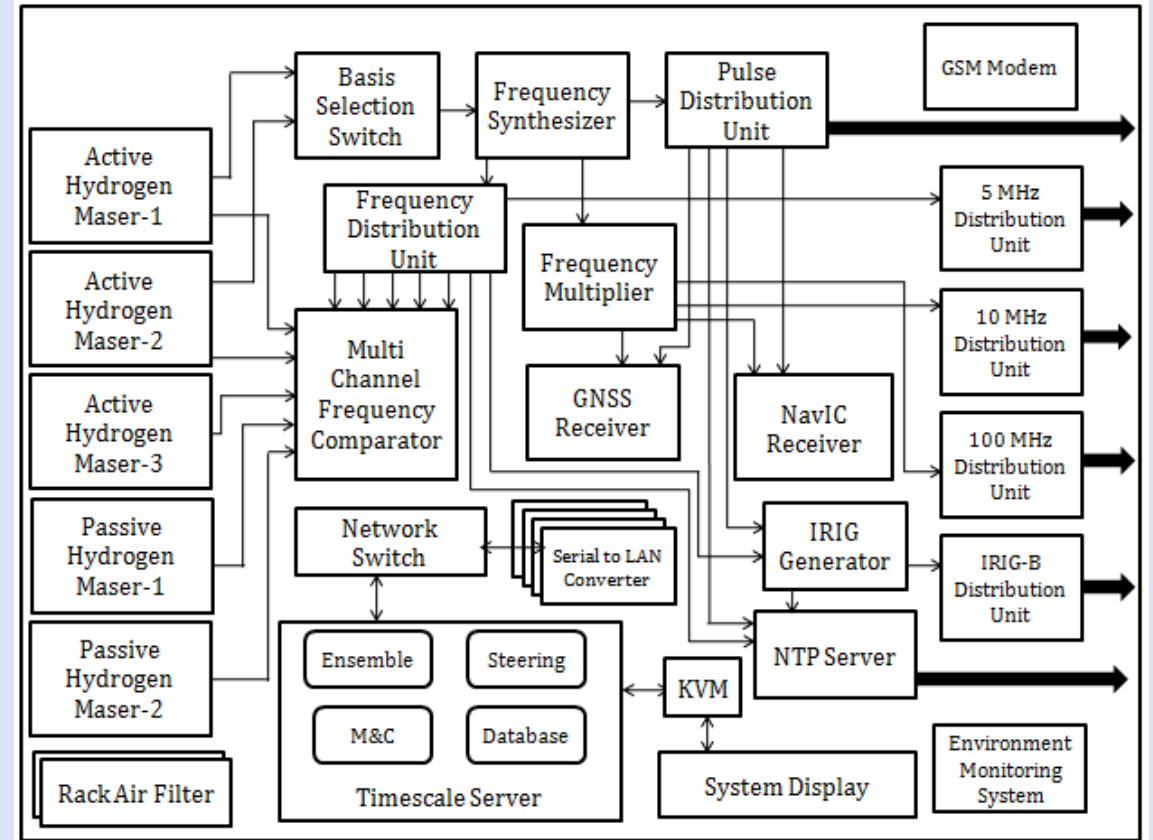


Fig: Block Diagram of Timescale System for VLBI station at Geodesy Village

Permanent GNSS Station

Receiver Type: Trimble Alloy

Constellations :

GPS+GLO+GAL+BDS+QZSS+IRNSS

Monument: Concrete Pillar

Antenna Type: Chokering Antenna with Radome

Installed at: 26-Feb-2021



Other Equipment



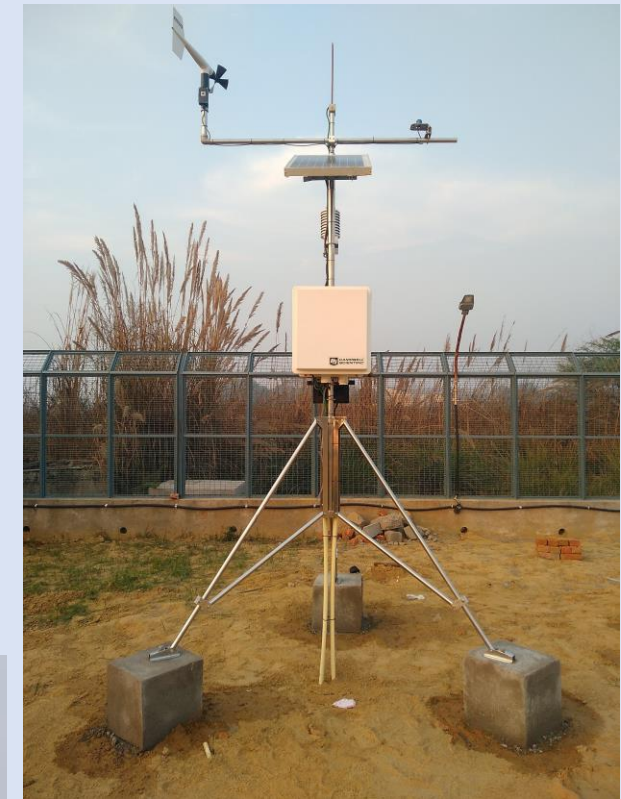
CG-6 Autograv Gravity Meter

Reading resolution : 1 microGal
Standard deviation : < 5 microGal
Operating range : World-wide (8,000 mGal without resetting)
Residual drift : < 20 microGal/day
Uncompensated drift : < 200 microGal/day
Range of automatic tilt compensation : ± 200 arcseconds
Automated corrections : Tide, instrument tilt, temperature, noisy sample filter, seismic noise filter, drift
Data output rate : User selectable up to 10 Hz
GPS accuracy: < 15 m; DGPS < 3 m
Operating temperature : -40 °C to + 45 °C (-40 °F to 113 °F)

Campbell Scientific Automatic Weather Station

Sensors

CS215-L Digital Air Temperature and Relative Humidity Sensor
03002-L Wind Sentry Set
TE525-L Rain Gage with 6 in. Orifice
CS100 Barometric Pressure Sensor
CS300-L Pyranometer



Measuring Parameters

- Wind speed
- Wind direction
- Air temperature
- Relative humidity
- Barometric pressure
- Precipitation
- Solar radiation

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Thank you