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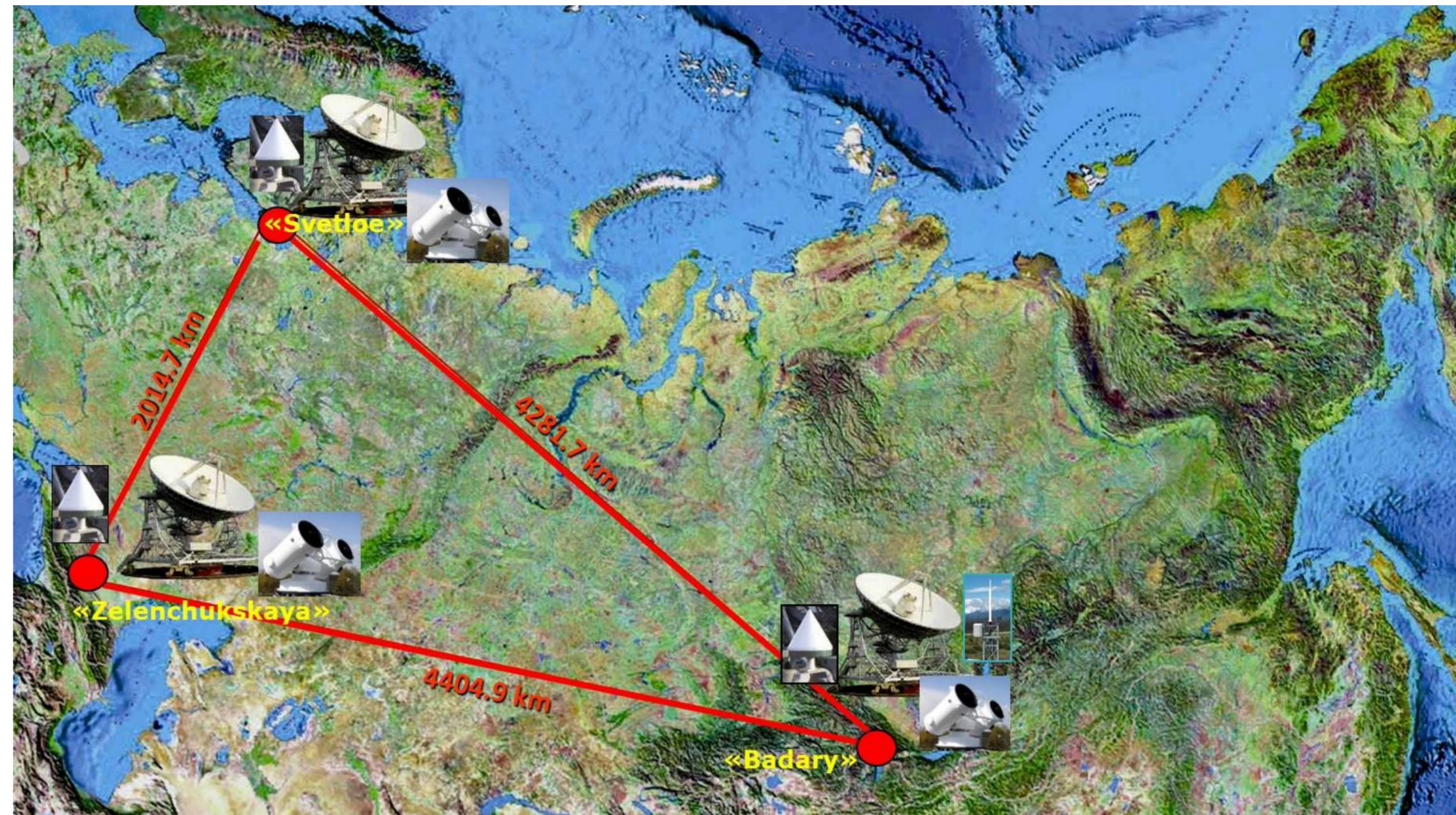
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SLR systems “Sazhen-TM” have been installed at all observatories of the “Quasar” VLBI network in 2011.

Timeline of the SLR system installation at the observatories

Observatory	Stage	2011										
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov			
Zelenchukskaya	Dome building	■										
	System installation		■									
	Testing			■	■	■						
Badary	Dome building				■							
	System installation					■						
	Testing						■	■	■			
Svetloe	Dome building							■				
	System installation								■			
	Testing									■	■	



“Quasar” network geometry

“Sazhen-TM” SLR system manufactured by «Research-and-Production Corporation “Precision Systems and Instruments”»

Main technical characteristics of the system:

Ranging distance:	
day	400-6000 km
night	400-23000 km
Aperture	25 cm
Wavelength	532 nm
Beam divergence	12”
Laser pulse frequency	300 Hz
Laser pulse width	300 ps
Pulse energy	2.5 mJ
Mass	170 kg
Normal points precision	1 cm
Angular precision	1-2”



Techniques, stations, observational programs

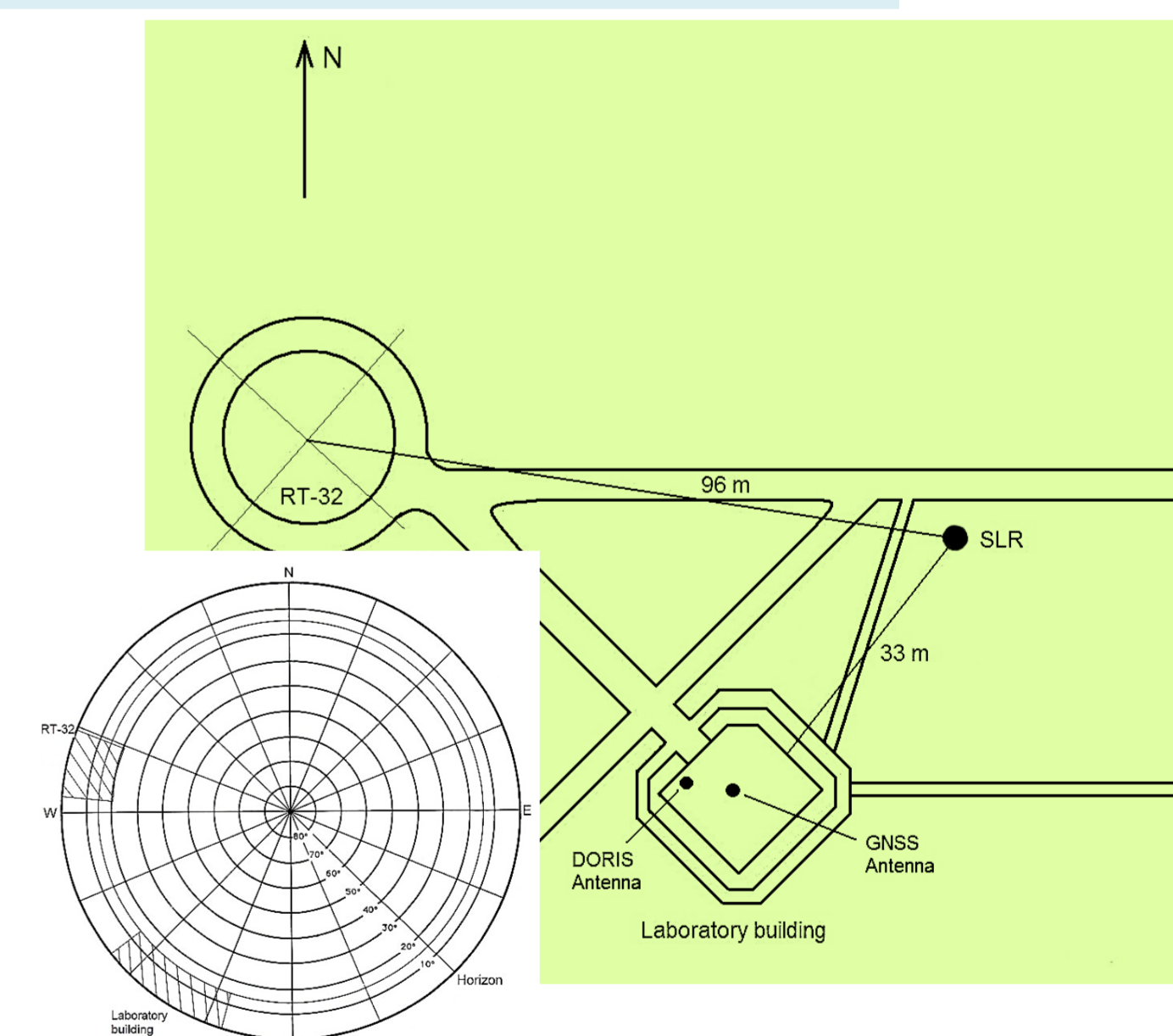
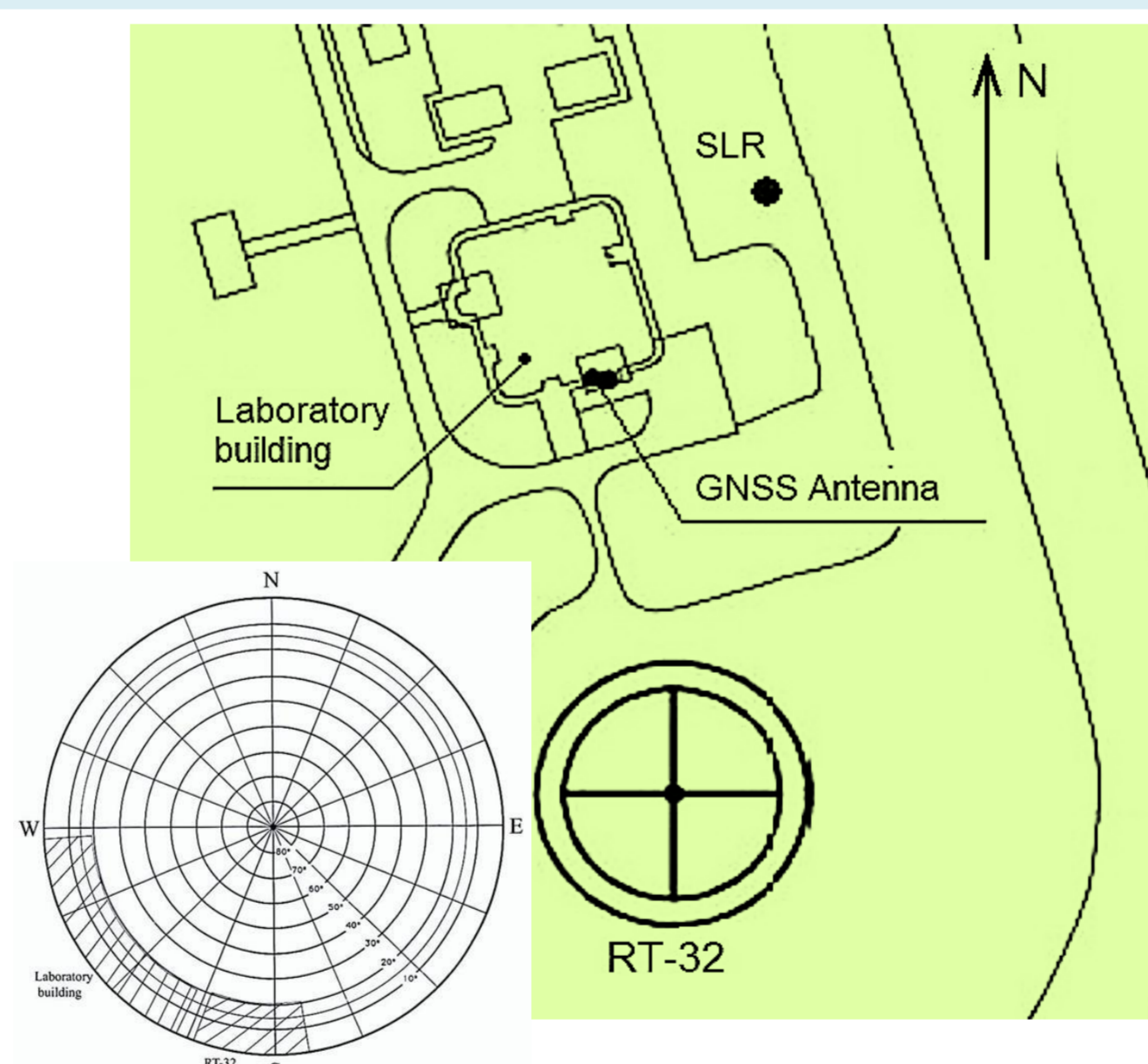
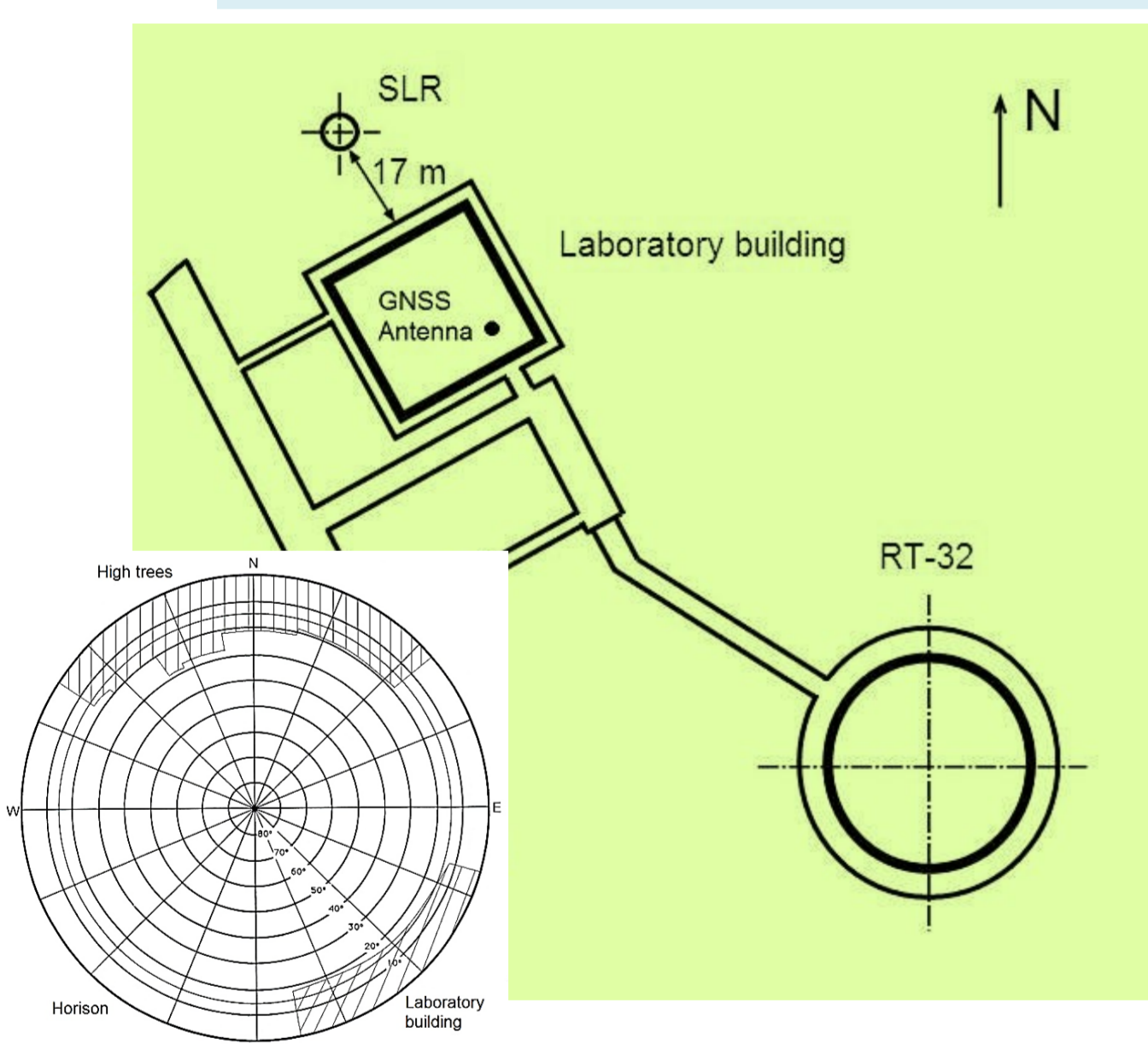
Technique \ Observatory		«Svetloe»	«Zelenchukskaya»	«Badary»
VLBI	IVS station (year)	Sv, 7380 (2003)	Zc, 7381 (2005)	Bd, 7382 (2006)
	Observational programs	IVS, Domestic	IVS, Domestic	IVS, Domestic
GNSS	IGS station (year)	SVTL (2004)	ZECK (1997)	BADG (2011)
	Observational programs	IGS, EPN	IGS, EPN	IGS
SLR	ILRS station (year)	1888 (2012)	1889 (2012)	1890 (2012)
	Observational programs	ILRS	ILRS	ILRS
DORIS	IDS station (year)			BADB (1992)
	Observational programs			IDS

«Svetloe» observatory

«Zelenchukskaya» observatory

«Badary» observatory

Location of observational instruments at the observatories and cut-off angles for installed SLR systems



Local tie parameters between reference points of SLR systems (intersection of axis) and GNSS antenna markers determined from geodetic surveying

[RP 1880 – RP SVTL]

ΔN, m	ΔE, m	ΔU, m
32.540±0.003	-23.158±0.003	-7.634±0.001

[RP 1889 – RP ZECK]

ΔN, m	ΔE, m	ΔU, m
30.683±0.002	25.381±0.002	-10.856±0.001

[RP 1890 – RP BADG]

ΔN, m	ΔE, m	ΔU, m
36.585±0.002	25.925±0.002	-8.085±0.001

