41. Provisional Result of the Work of the International Latitude Service in the North Parallel $+39^{\circ} 8'$ during the Year 1934.

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The Number of the International Stations is five.

Change of Observers has been made at Mizusawa, viz. Mr. Kawasaki has taken place of Mr. Goto on October 6, 1934. At Kitab, three observers Messrs. Stoiloff, Schtschirgezky and Senutovitch were working alternatively for month but not for days.

Observing Programme is the same as in the preceding years.

Weather Conditions:—During the year the weather conditions in all stations were usually good throughout except the winter season. It is noted that it was specially bad in July at Mizusawa.

Values of One Revolution of the Micrometer, their Temperature-Coefficients and Inequalities of the Screw:—The adopted values for the former two values are:—

for Mizusawa	39''.956	—''.00056 (T-7°.9)
„ Kitab	39''.746	—''.00120 (T-11°.5)
„ Carloforte	39''.753	—''.00126 (T-16°.1)
„ Gaithersburg	39''.612	—''.00074 (T-9°.7)
„ Ukiah	39''.754	—''.00120 (T-9°.4)

Besides them, slow variations of the values of the micrometer were applied.

The inequalities of the screw at all stations were applied, the same values as in the year 1933 being used.

The Mean of the Group:—The method of taking the mean of the group is the same as in the previous years.

TABLE 1. Mean of the Group.

EVENING GROUP.

Group	Mizusawa $\phi_0 = 3''.37$			Kitab $\phi_0 = 1''.65$			Carloforte $\phi_0 = 8''.86$			Gaithersburg $\phi_0 = 13''.16$			Ukiah $\phi_0 = 12''.00$		
	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ
			''			''			''			''			''
IV	.05	80	3.78	.08	48	1.94	.06	31	9.17	.05	80	13.36	.06	79	12.34
V	.14	38	3.83	.15	52	1.89	.13	92	9.08	.14	48	13.41	.15	56	12.30
VI	.23	73	2.82	.21	46	0.86	.22	43	8.04	.22	67	12.47	.23	80	11.45
VII	.31	122	3.60	.33	50	1.64	.31	97	8.77	.31	115	13.25	.31	71	12.21
VIII	.38	70	3.17	.40	56	1.19	.39	70	8.42	.39	118	12.83	.38	56	11.81
IX	.47	88	3.28	.48	80	1.42	.48	116	8.67	.47	105	13.12	.48	104	12.08
X	.58	12	3.61	.57	64	1.77	.56	143	9.14	.56	106	13.57	.56	96	12.45
XI	.64	79	3.22	.64	78	1.53	.65	140	8.81	.65	112	13.15	.64	128	12.05
XII	.72	44	3.03	.73	69	1.19	.73	145	8.53	.73	83	13.01	.73	110	11.79
I	.81	90	3.53	.83	53	1.87	.82	82	9.10	.80	142	13.56	.81	80	12.32
II	.89	70	3.36	.90	48	1.48	.90	96	8.82	.89	108	13.17	.90	56	11.98
III	.96	102	3.39	.99	42	1.63	.99	37	8.93	.98	75	13.30	.97	57	12.08

MORNING GROUP.

Group	Mizusawa $\phi_0=3''.37$			Kitab $\phi_0=1''.65$			Carloforte $\phi_0=8''.86$			Gaithersburg $\phi_0=13''.16$			Ukiah $\phi_0=12''.00$		
	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ	Date 1934	No. Obs.	ϕ
V	.05	53	3.86	.08	38	1.97	.05	23	9.21	.05	67	13.47	.06	69	12.39
VI	.15	17	2.86	.15	44	0.88	.13	69	8.18	.14	45	12.53	.14	49	11.46
VII	.22	80	3.64	.21	39	1.69	.21	33	8.86	.22	48	13.27	.23	79	12.26
VIII	.31	99	3.20	.33	47	1.25	.31	62	8.39	.31	95	12.89	.31	69	11.87
IX	.38	68	3.39	.40	54	1.44	.39	70	8.66	.39	113	13.13	.39	48	12.08
X	.47	74	3.69	.48	72	1.75	.48	102	9.10	.47	87	13.53	.48	104	12.46
XI	.57	9	3.16	.57	44	1.35	.56	140	8.75	.56	83	13.15	.56	96	12.10
XII	.63	43	2.95	.65	76	1.34	.65	130	8.56	.65	84	12.96	.64	125	11.79
I	.72	39	3.56	.73	66	1.82	.73	147	9.15	.74	43	13.67	.72	99	12.32
II	.81	105	3.27	.83	40	1.54	.82	75	8.86	.80	122	13.24	.81	79	12.02
III	.89	52	3.38	.90	41	1.62	.90	82	8.90	.89	107	13.28	.90	54	12.04
IV	.95	79	3.69	1.00	34	2.03	.99	21	9.18	.98	45	13.54	.97	54	12.34

*The Values of x , y and $\Delta\delta'$:—*The process of the calculations and the formula are the same as in the annual report of the previous year 1933. It is noted that $\Delta\delta'$ should be the declination errors with the mean values of non-polar variations in the five stations.

TABLE 2.

Date	x_e	x_m	Mean	y_e	y_m	Mean	$\Delta\delta'_e$	$\Delta\delta'_m$	Diff. of the same Group $e-m$	Combination
1934.06	''	''	''	''	''	''	''	''	''	
.14	-.070	-.084	-.077	-.052	-.032	-.042	+.317	+.376	-.008	IV V
.22	-.124	-.117	-.121	-.042	+.036	-.003	+.300	-.625	-.076	V VI
.30	-.168	-.170	-.169	+.034	+.020	+.027	-.674	+.138	-.049	VI VII
.39	-.187	-.186	-.187	+.027	+.051	+.039	+.099	-.276	-.039	VII VIII
.47	-.150	-.145	-.148	+.037	+.070	+.054	-.318	-.059	-.042	VIII IX
.55	-.097	-.090	-.094	+.106	+.123	+.115	-.094	+.302	-.035	IX X
.64	-.037	-.029	-.033	+.145	+.174	+.160	+.296	-.110	-.006	X XI
.72	+.015	+.038	+.027	+.084	+.087	+.086	-.062	-.296	+.048	XI XII
.80	+.023	+.043	+.034	+.135	+.146	+.141	-.300	+.288	-.004	XII I
.89	+.031	+.036	+.034	+.107	+.096	+.102	+.259	-.024	-.029	I II
.97	+.029	+.016	-.007	+.056	+.060	+.058	-.047	+.033	-.023	II III
	+.007	+.002	+.005	+.072	+.010	+.041	+.054	+.343	+.021	III IV

*The Separation of $\Delta\delta'$ into $\Delta\delta$ and z :—*As in the last year, the separation $\Delta\delta'$ into $\Delta\delta$ and z were tried. At first we have to determine z for each station. The difference of the constant parts of z for each evening and morning observations which makes the "closing sum" is as follows for each station;

	Mizusawa	Kitab	Carloforte	Gaithersburg	Ukiah
$e-m$	(-'' .002)	-'' .013	-'' .025	-'' .038	-'' .015

The results of another principal term of z of the form $+r_2 \sin(2\odot - \alpha + A_2)$ are given below :

Station	Mizusawa	Kitab	Carloforte	Gaithersburg	Ukiah
r_2	+'' .030	—	+'' .021	+'' .037	+'' .034
A_2	+10°	—	-30°	+6°	+10°

These values r_2 and A_2 were found from the data of this year only.

After correcting all values of latitudes given in the table 1 by the respective z for all stations, the values of x , y and $\Delta\delta$ were again calculated by the same formula giving the following results.

TABLE 3.

Date	x_e	x_m	Mean	y_e	y_m	Mean	Group	$\Delta\delta_e$	$\Delta\delta_m$	$\Delta\delta_e - \Delta\delta_m$
1934.06	"	"	"	"	"	"	IV	+.312	"	"
.14	-.120	-.122	-.121	-.039	+.020	-.010	V	+.308	+.348	-.040
.22	-.170	-.180	-.175	+.043	+.010	+.027	VI	-.654	-.647	-.007
.30	-.191	-.201	-.196	+.040	+.048	+.044	VII	+.129	+.128	+.001
.39	-.152	-.161	-.157	+.054	+.072	+.063	VIII	-.282	-.273	-.009
.47	-.095	-.105	-.100	+.122	+.127	+.125	IX	-.059	-.048	-.011
.55	-.029	-.040	-.035	+.156	+.178	+.167	X	+.323	+.319	+.004
.64	+.028	+.032	+.030	+.089	+.088	+.089	XI	-.045	-.095	+.050
.72	-.005	+.043	+.019	+.134	+.140	+.137	XII	-.296	-.286	-.010
.80	+.051	+.040	+.046	+.100	+.085	+.093	I	+.253	+.287	-.034
.89	-.011	+.021	+.005	+.046	+.041	+.044	II	-.059	-.038	-.021
.97	+.022	+.007	+.015	+.062	-.010	+.026	III	+.042	+.009	+.033
							IV	—	+.314	

In comparing the smoothed values of x and y for each tenth of the year deduced from their mean values given in the tables 2 and 3 they are nearly the same. But as the latter result seems to be more probable than the former, I have adopted the values from table 3. They are as follows:

TABLE 4.

Date	x	y	Date	x	y
1934.0	"	"	1934.5	"	"
.1	-.03	-.05	.6	-.08	+.12
.2	-.10	-.03	.7	-.01	+.14
.3	-.16	+.01	.8	+.02	+.13
.4	-.19	+.05	.9	+.03	+.09
.5	-.15	+.09		+.02	+.05