In [1]:

```
# plot.ipynb : Vipin Maurya
# jupyter-nbconvert --to pdfviahtml plot.ipynb
import pandas as pd
import pygmt

loc = pd.read_csv('loc.csv')
loc
```

Out[1]:

	Date	Time	Err	RMS	latitude	longitude	Author
0	1934/01/15	08:43:18	NaN	NaN	26.5000	86.5000	GUTE
1	1934/01/15	08:43:25	NaN	NaN	26.6000	86.8000	ISS
2	1934/01/15	08:43:25.39	NaN	NaN	26.7730	86.7620	CENT
3	1934/01/15	08:43:30	NaN	NaN	26.0000	85.5000	CGS
4	1934/01/15	08:43:25.58	0.31	4.105	26.8847	86.5885	ISC
5	1934/01/15	08:43:25.58	NaN	NaN	27.2900	87.1048	NLLoc

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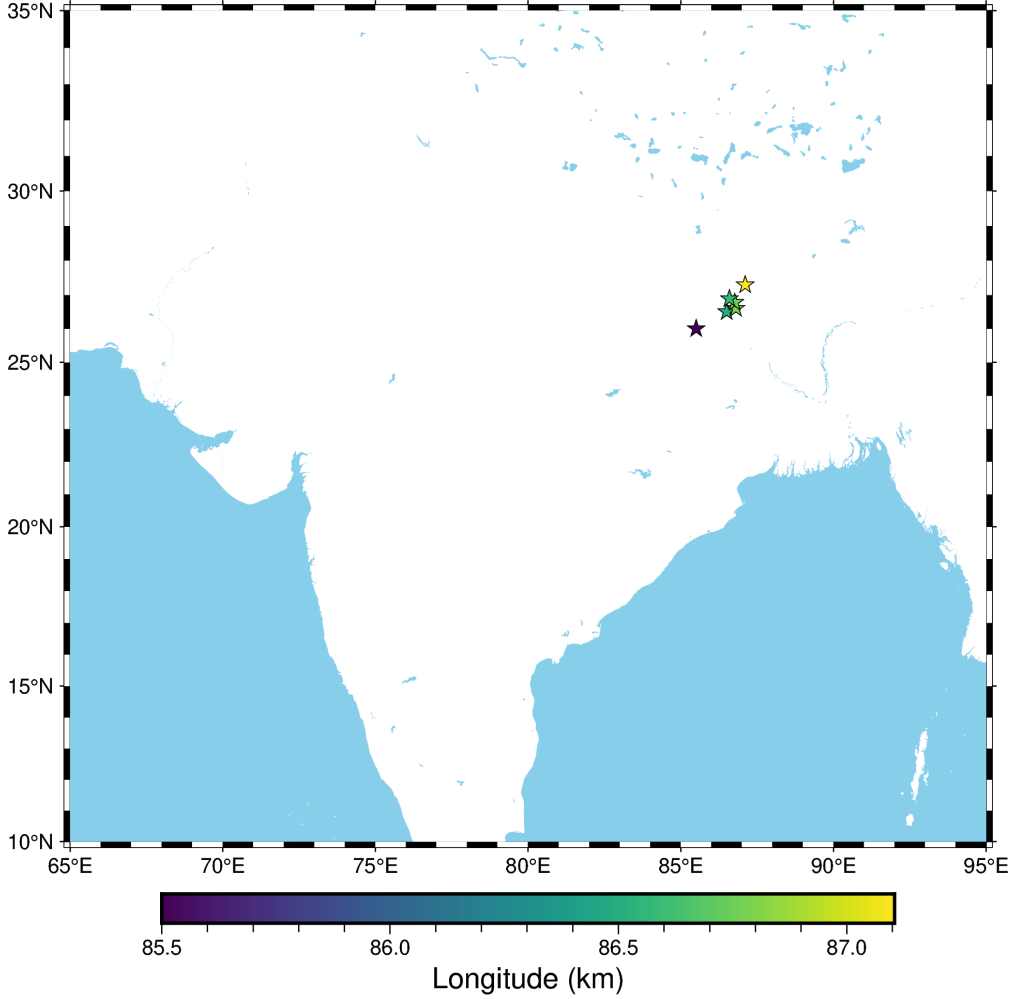
4	1934/01/15	08:43:25.58	0.31	4.105	26.8847	86.5885	ISC
5	1934/01/15	08:43:25.58	NaN	NaN	27.2900	87.1048	NLLoc

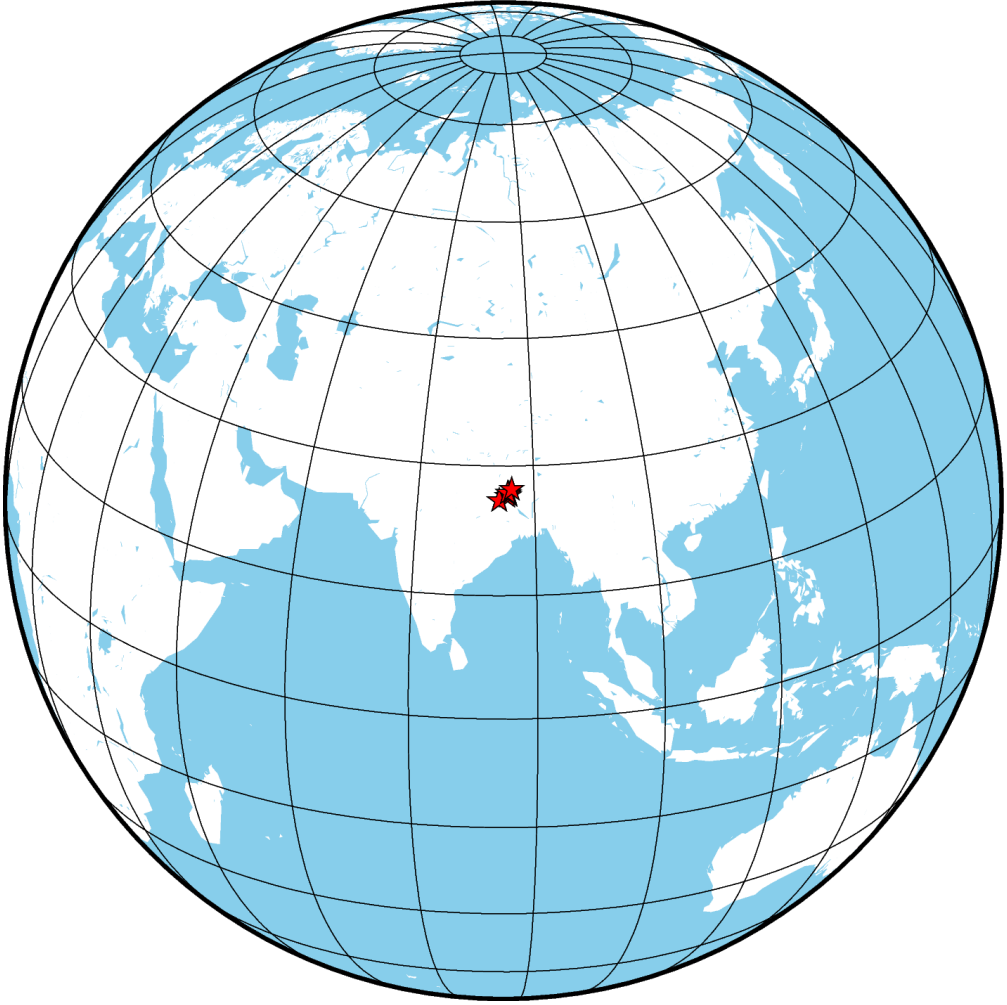
In [7]:

```
region = [65, 95, 10, 35 ]
fig = pygmt.Figure()
fig.basemap(region=region, projection="M15c", frame=True)
fig.coast(land="white", water="skyblue")
pygmt.makecpt(cmap="viridis", series=[loc.longitude.min(), loc.longitude.max()])
fig.plot(
    x=loc.longitude,
    y=loc.latitude,
    color=loc.longitude,
    cmap=True,
    style="a0.3c",
    pen="black"
)
# fig.text(text="NLLoc", x=87.1048, y=27.2900)
fig.colorbar(frame='af+l"Longitude (km)"')
# fig.show(method="external")
fig.show()
```



In [4]:

```
fig = pygmt.Figure()
# Orthographic
fig.coast(projection="G86/26/12c", region="g", frame="g", land="white", water="skyblue")
fig.plot(
    x=loc.longitude,
    y=loc.latitude,
    style="a0.3c",
    color="red",
    pen="black"
)
fig.show()
```



In [6]:
```
data = pd.read_csv('data.csv')
data
```

Out[6]:

	Sta	Latitude	Longitude	Elevation	Dist	EvAz	Phase	Time	TRes
0	CAL	22.53917	88.33067	6.0	4.61	159.5	Pn	08:44:18.0	-16.7
1	AGR	27.13330	78.01670	163.0	7.65	273.8	Pn	08:45:10.0	-6.5
2	AGR	27.13330	78.01670	163.0	7.65	273.8	Pb	08:46:10.0	32.0
3	DDI	30.32250	78.05560	682.0	8.24	296.5	Pn	08:45:10.0	-14.8
4	BOM	18.89583	72.81267	6.0	14.97	240.8	Pn	08:46:46.0	-10.7
...	...	...	...	...	...	...	...	...	...
489	LPZ	-16.49530	-68.13270	3658.0	154.38	288.6	M	10:06:06	___
490	LPZ	-16.49530	-68.13270	3658.0	154.38	288.6	M	10:08:00	___
491	LPZ	-16.49530	-68.13270	3658.0	154.38	288.6	M	10:09:03	___
492	LPZ	-16.49530	-68.13270	3658.0	154.38	288.6	M	10:15:08	___
493	LPZ	-16.49530	-68.13270	3658.0	154.38	288.6	M	10:19:28	___

494 rows × 9 columns

In [7]:
```
region = [
    data.Longitude.min() - 1,
    data.Longitude.max() + 1,
    data.Latitude.min() - 1,
    data.Latitude.max() + 1,
```

```
]
fig = pygmt.Figure()
# Orthographic
# fig.basemap(
# #     # set map limits to theta_min = 0, theta_max = 90, radius_min = 3480,
# #     # radius_max = 6371 (Earth's radius)
#     region=[0, 360, 0, 6371],
# #     region = region,
#     # set map width to 5 cm and interpret input data as geographic azimuth instead
#     # of standard angle, rotate coordinate system counterclockwise by 45 degrees
#     projection="P5c+a+t45",
#     # set the frame and color
#     frame=["xa30f", "ya", "WNse+gbisque"],
# )
fig.coast(projection="G86/26/12c", region="g", frame="g", land="white", water="skyblue")
fig.plot(
    x=loc.longitude,
    y=loc.latitude,
    color="red",
    style="a0.3c",
    pen="black"
)
fig.plot(
    x=data.Longitude,
    y=data.Latitude,
    style="i0.3c",
    color="violet",
    pen="black"
)
fig.show()
```