BeiDou relative positioning performance by using short/zero baseline

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Multi-GNSS integration

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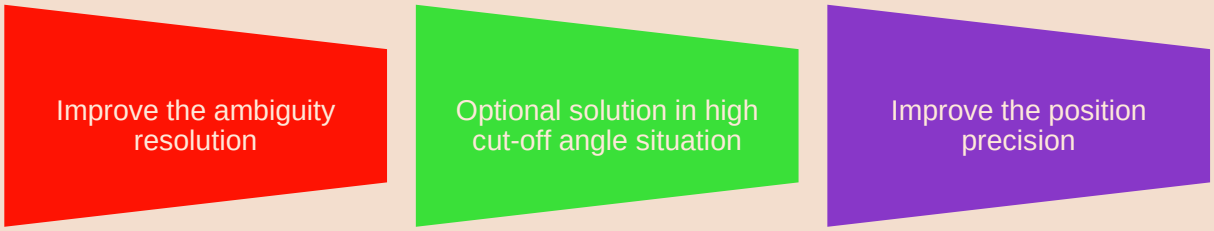
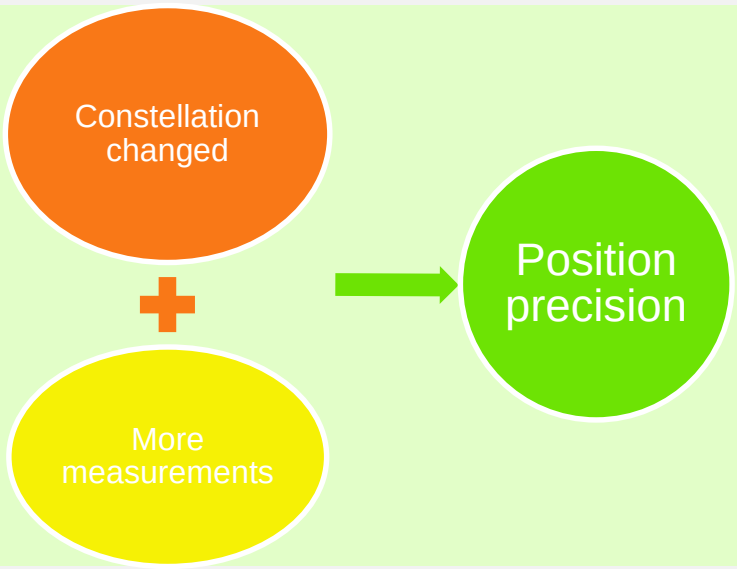
Advantage of integrating GPS/BDS





BeiDou constellation

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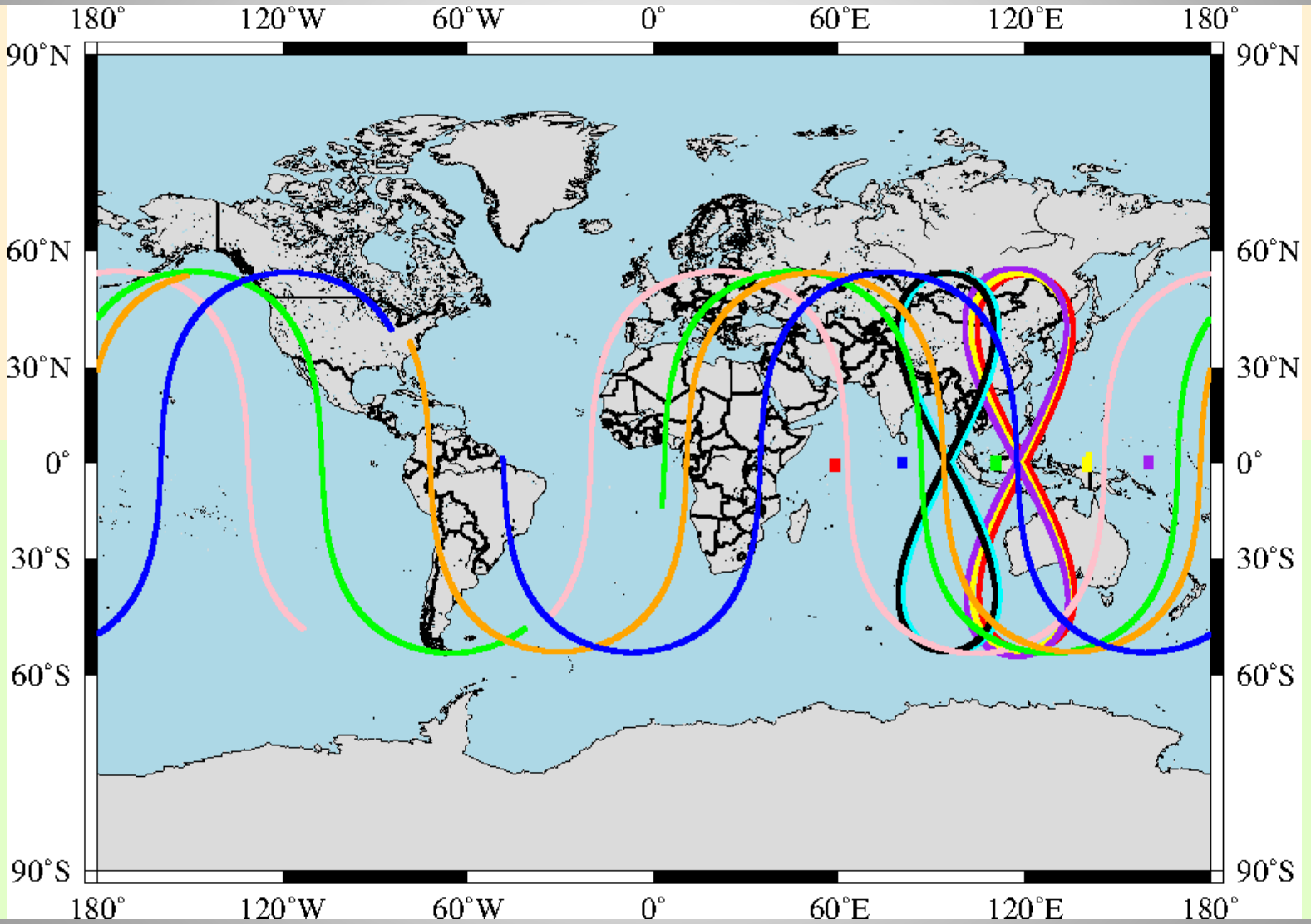

Elevation dependent errors

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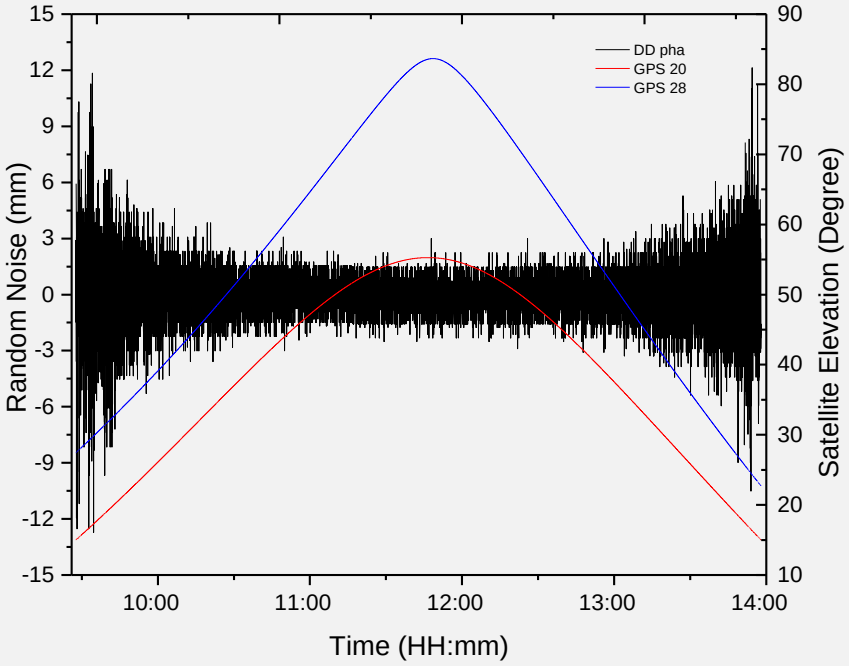

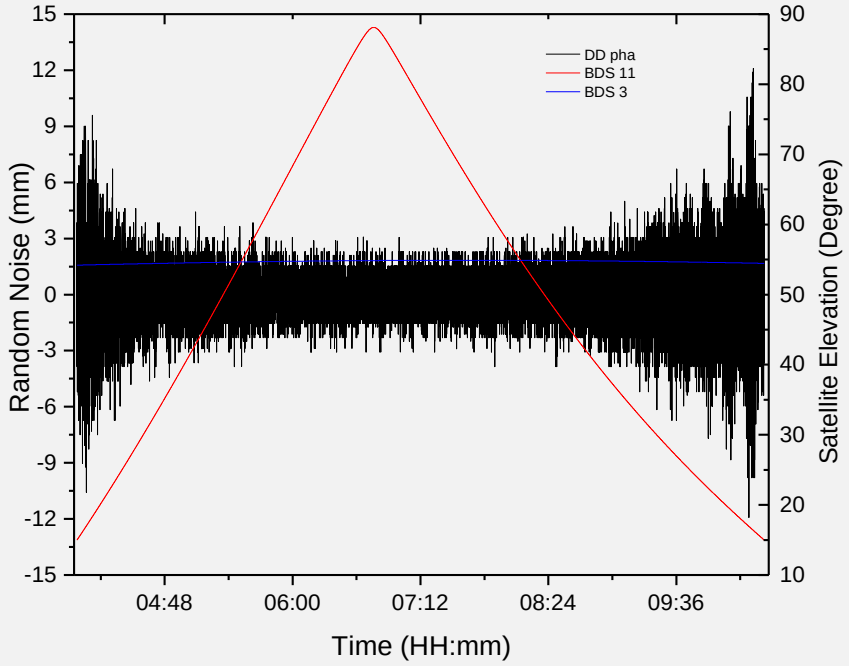

GPS/BDS double differenced random error (cutoff angle: 45 degree)

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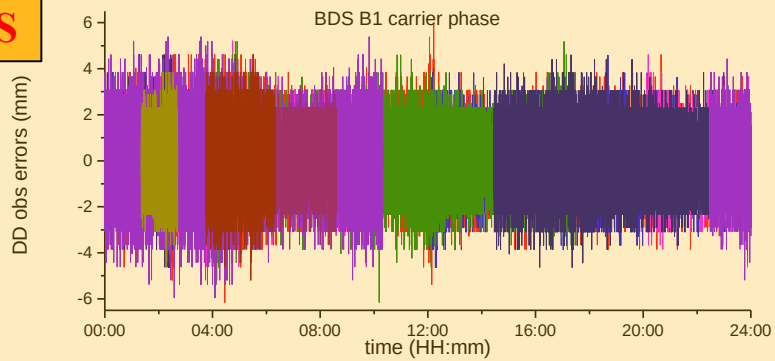
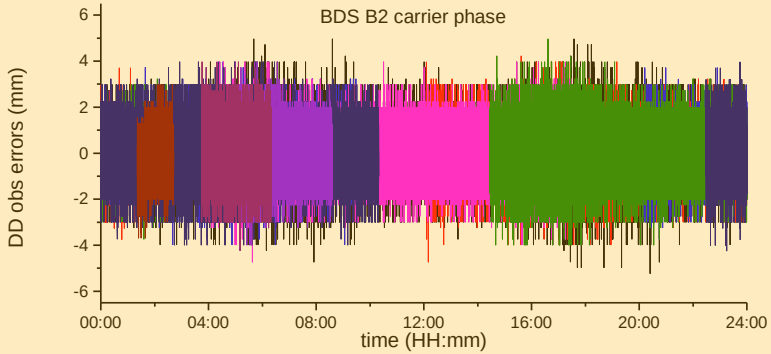
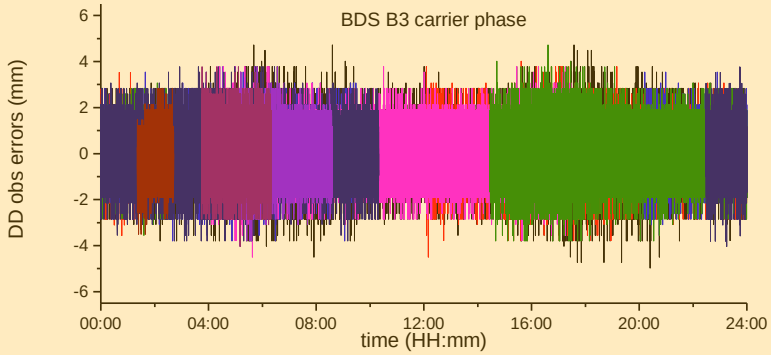
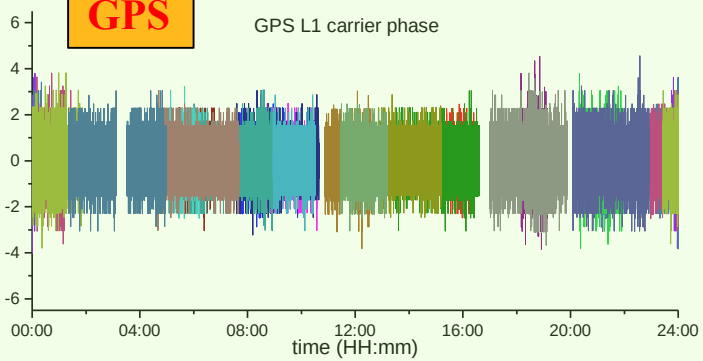
BDS

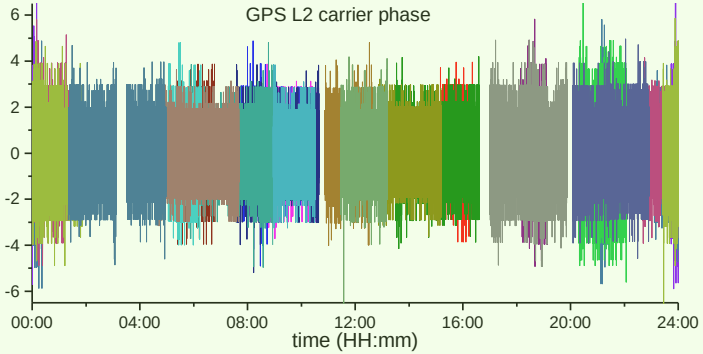




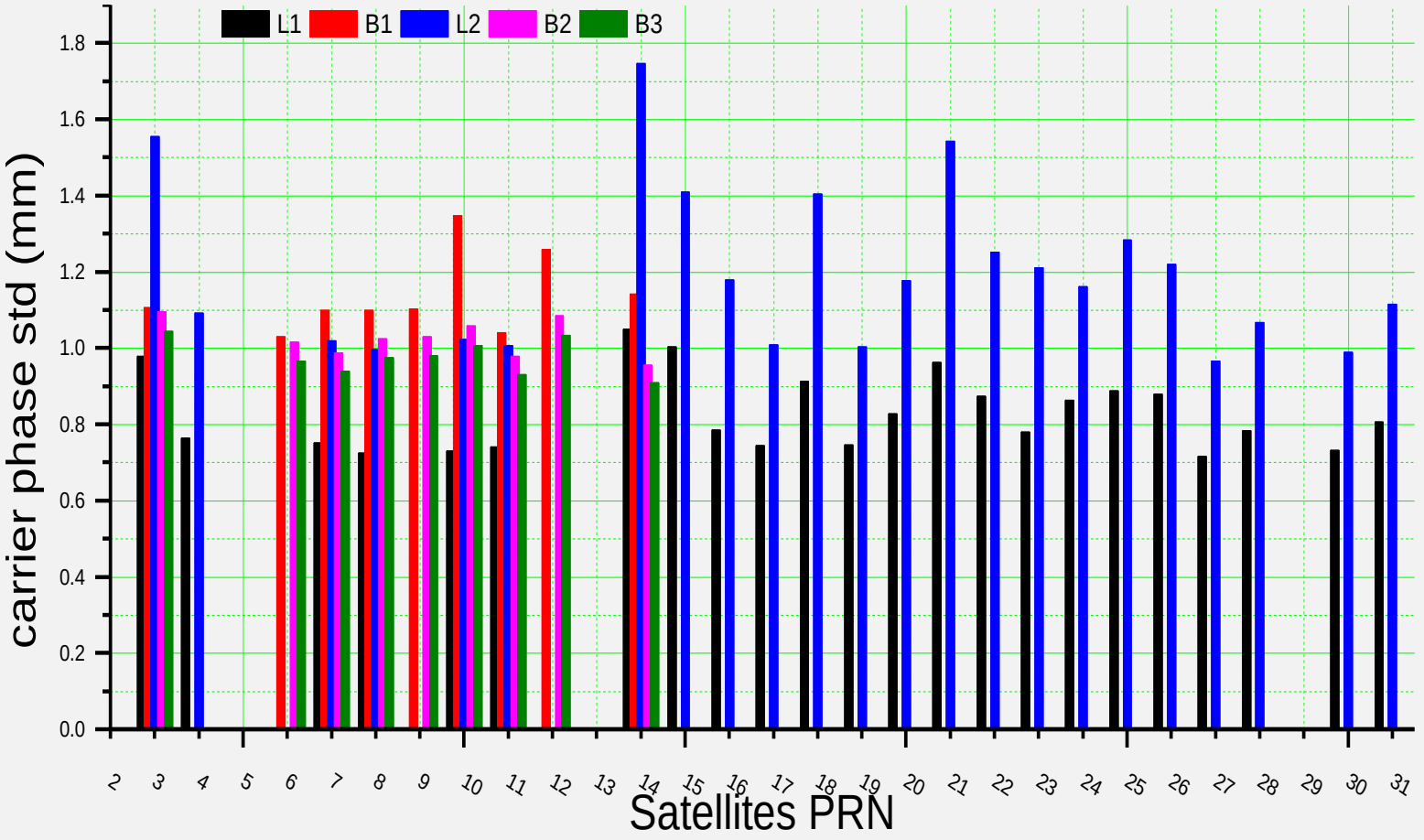


GPS

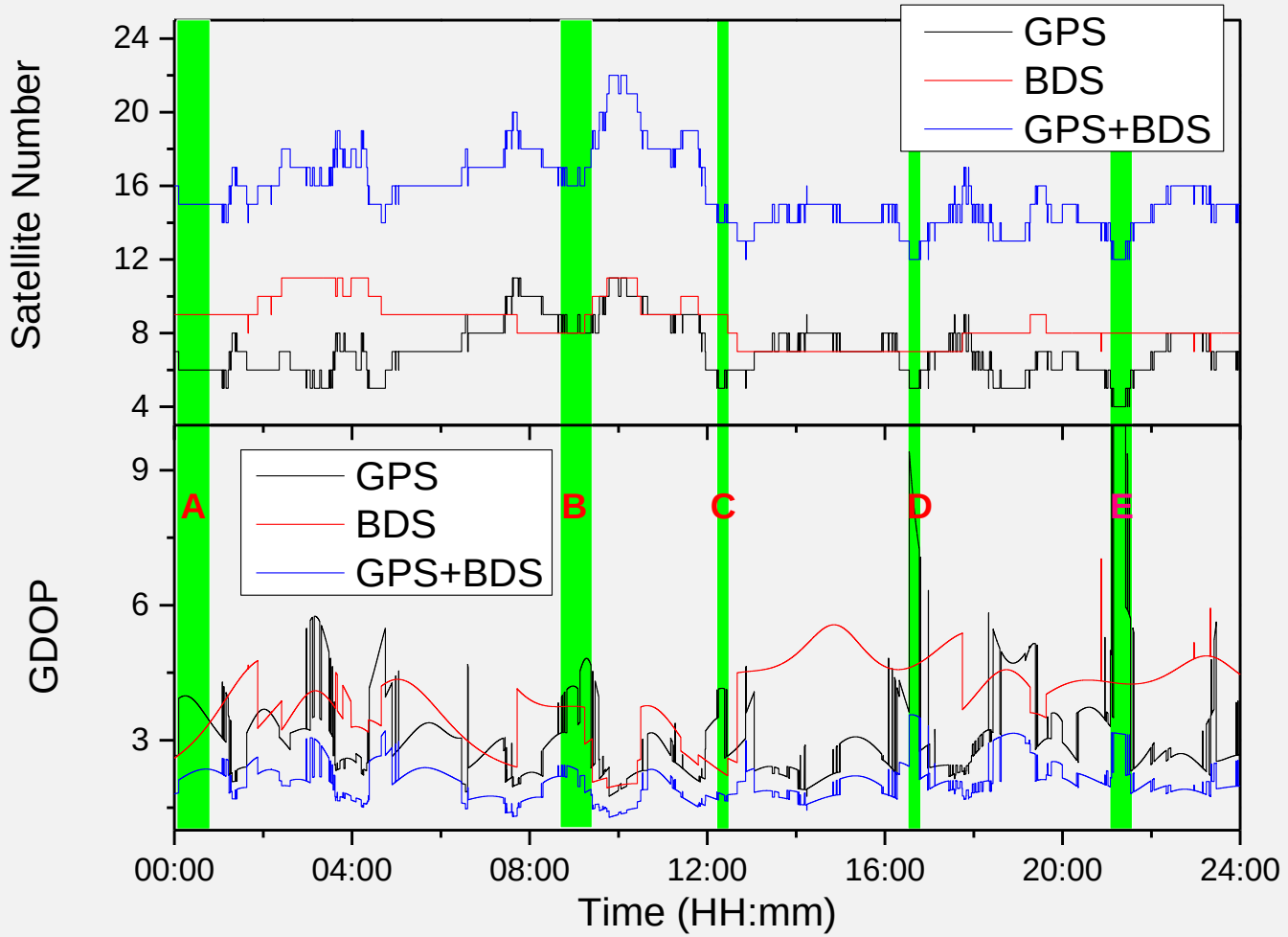




Standard deviation of GPS/BDS each measurement (cut-off angle is 45 degree)



Number of tracked satellites and its GDOP



GPS position error by L1 & L2 measurement

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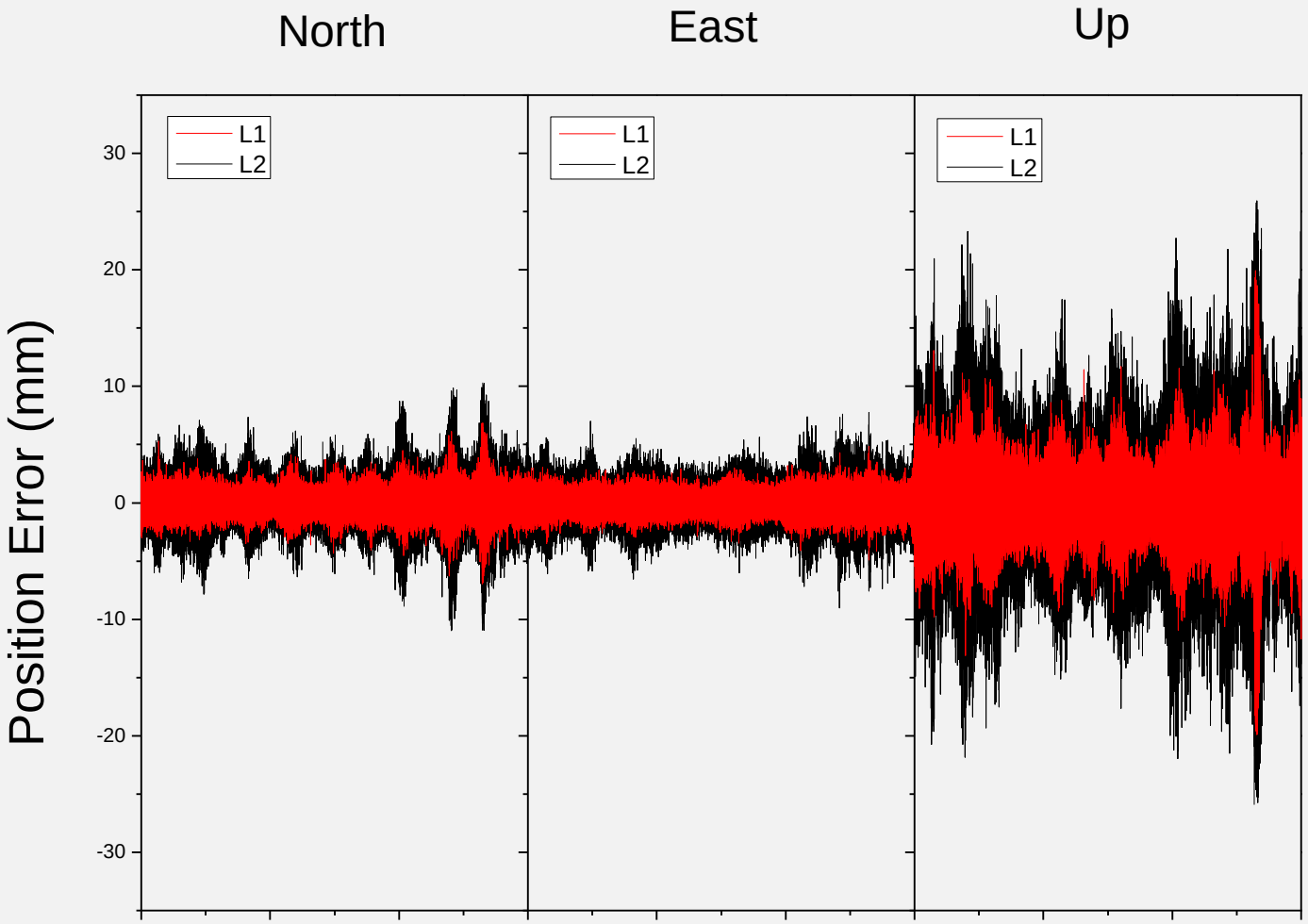
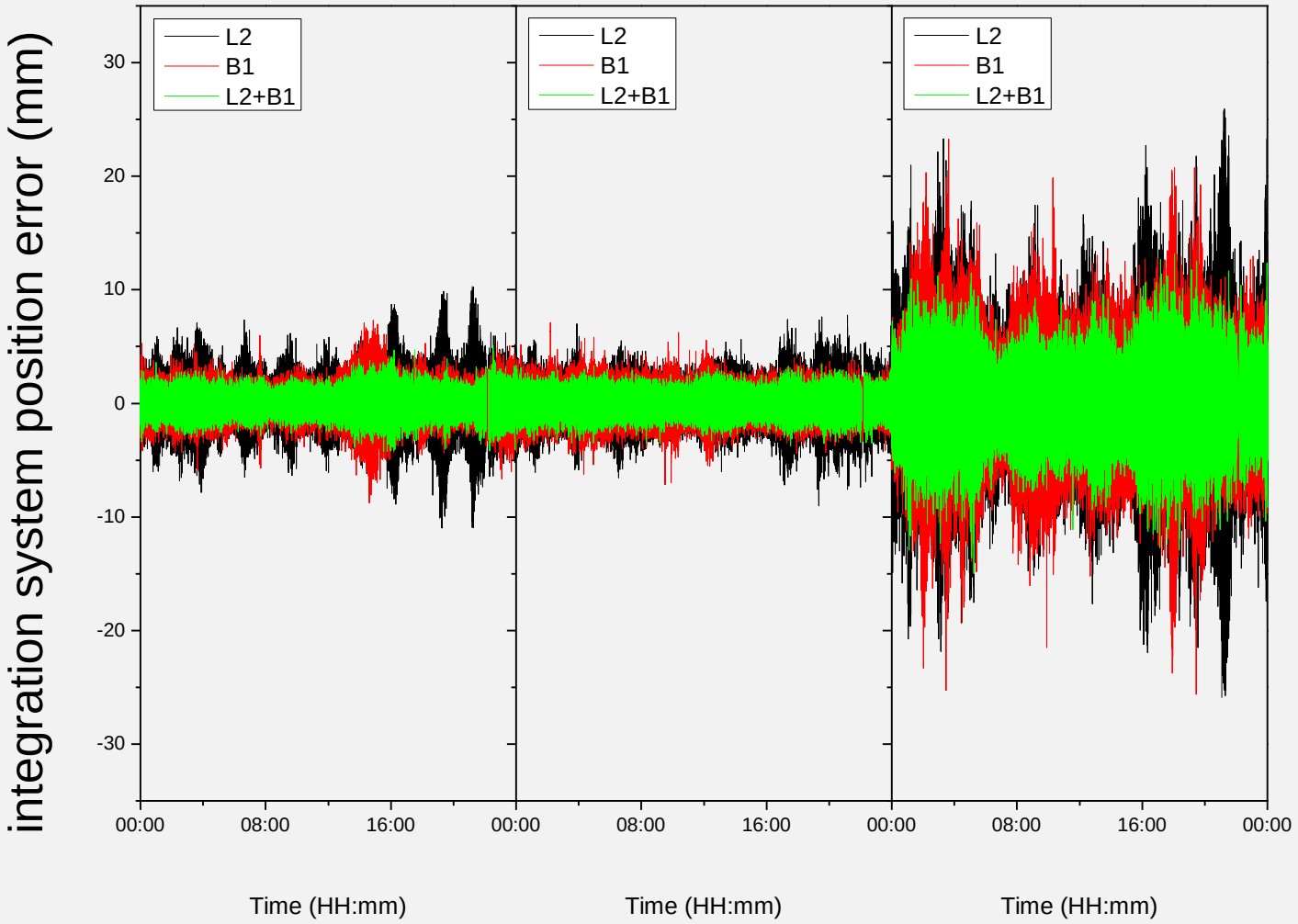
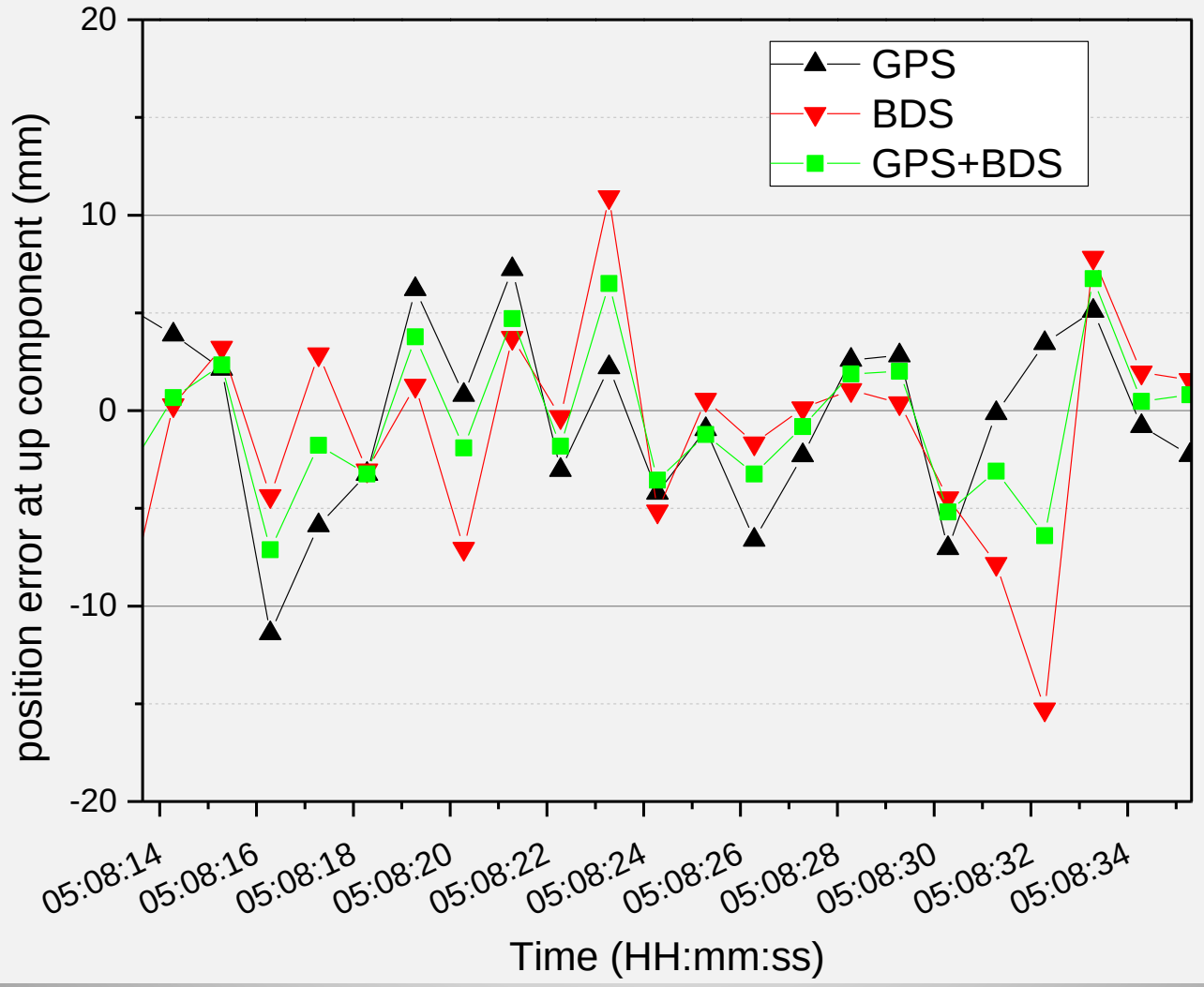
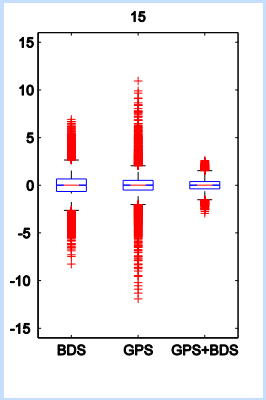
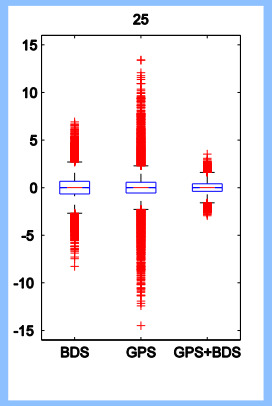
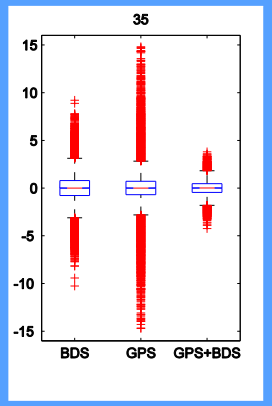
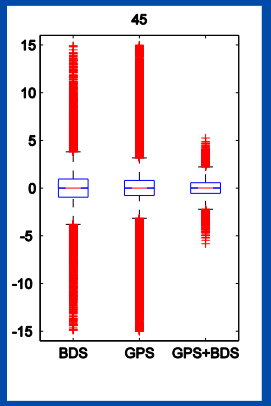
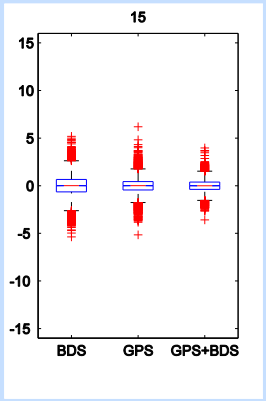
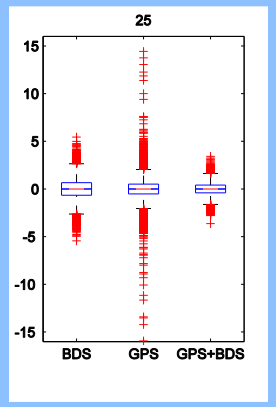
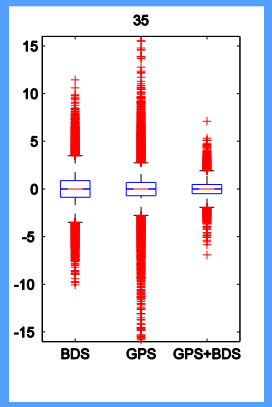
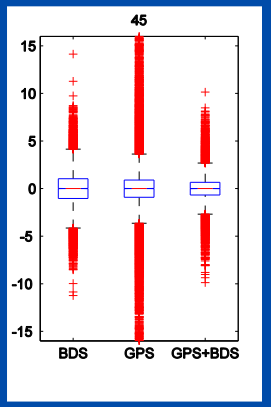
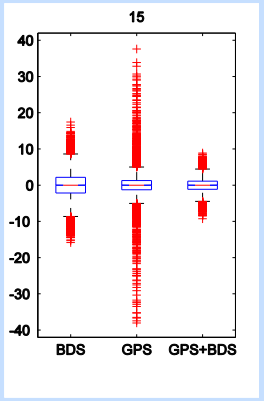
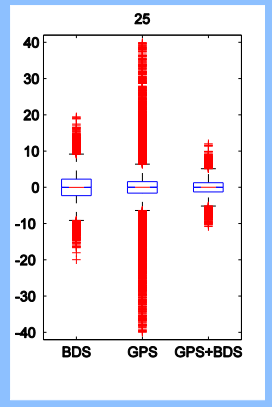
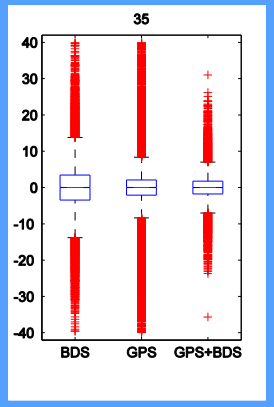
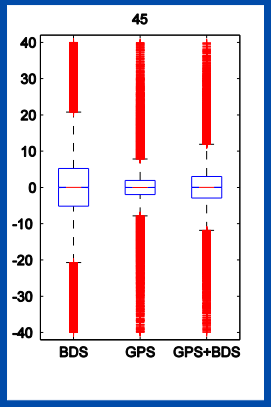


BDS B1, GPS L2 position error compare, and integration system performance



BDS B1, GPS L2 position error compare and integration system performance



	15	25	35	45
North				
East				
Up				

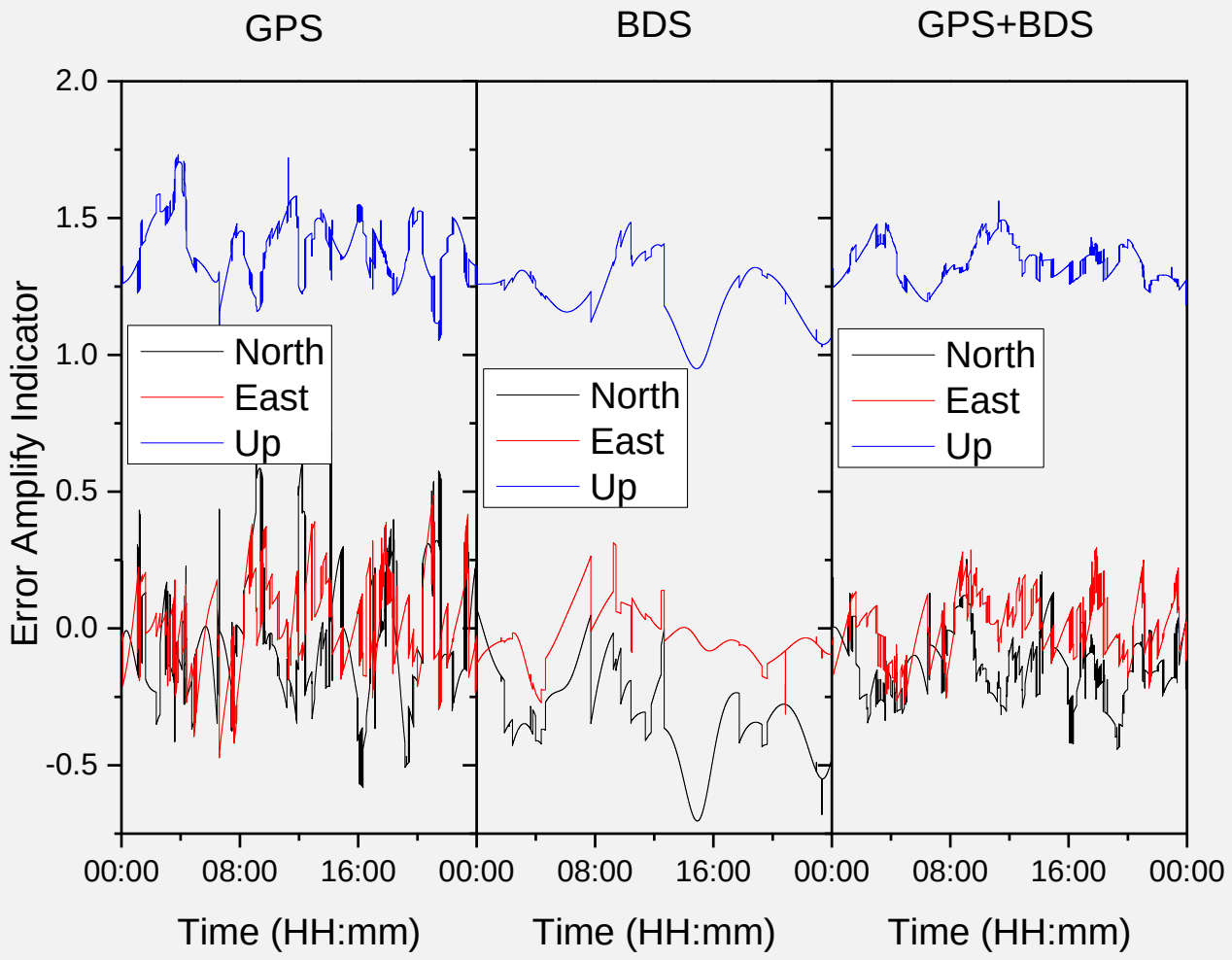
Error amplify indicator

$$\delta x_{sys} = h_{[1,1]_{sys}} \delta k_{[1]_{sys}} + h_{[1,2]_{sys}} \delta k_{[2]_{sys}} + \cdots + h_{[1,(n-1)]_{sys}} \delta k_{(n-1)_{sys}} = \sum_{m=1}^{n-1} h_{[1,m]_{sys}} \delta k_{sys}$$

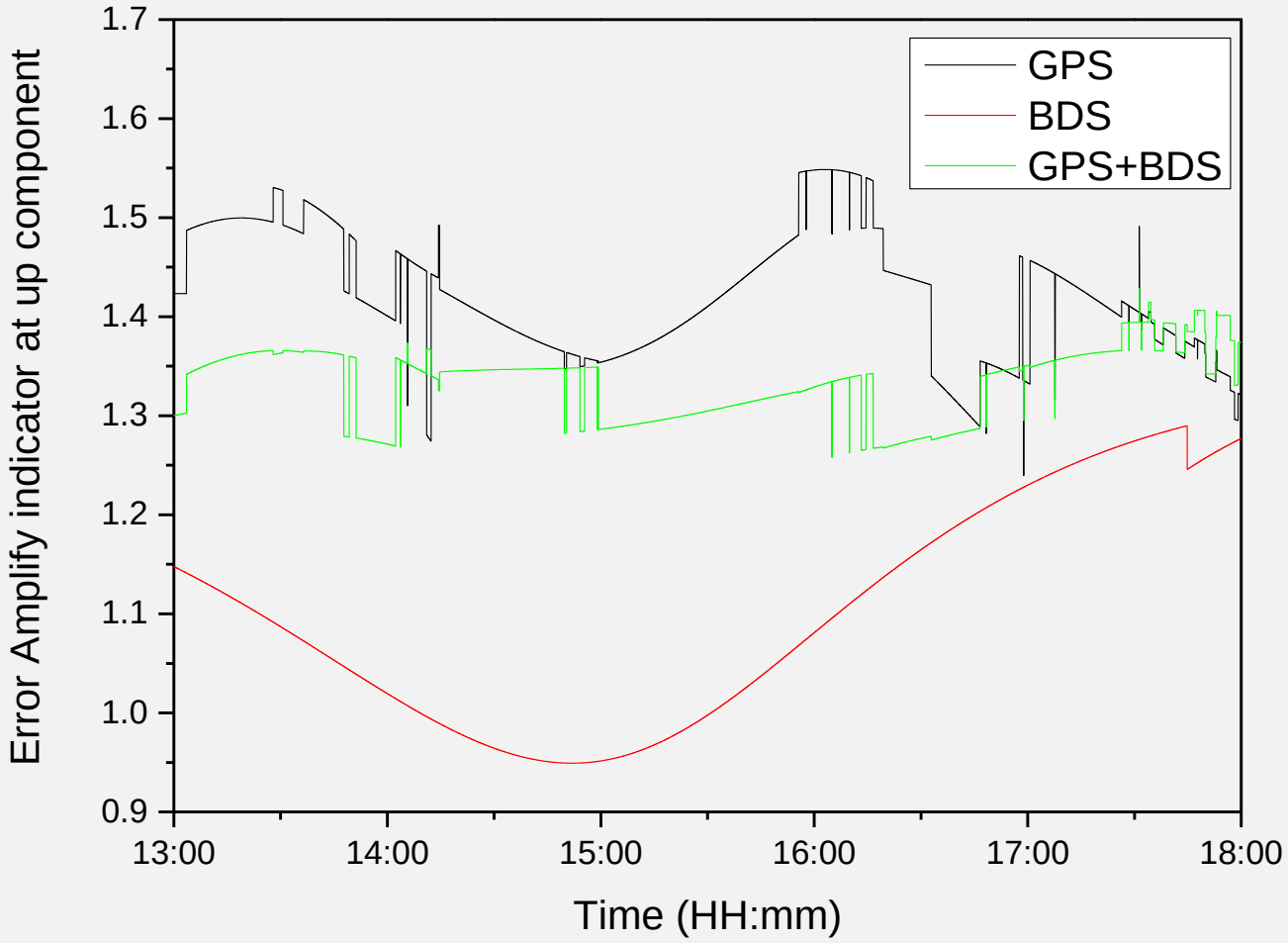
$$\delta y_{sys} = h_{[2,1]_{sys}} \delta k_{[1]_{sys}} + h_{[2,2]_{sys}} \delta k_{[2]_{sys}} + \cdots + h_{[2,(n-1)]_{sys}} \delta k_{(n-1)_{sys}} = \sum_{m=1}^{n-1} h_{[2,m]_{sys}} \delta k_{sys}$$

$$\delta z_{sys} = h_{[3,1]_{sys}} \delta k_{[1]_{sys}} + h_{[3,2]_{sys}} \delta k_{[2]_{sys}} + \cdots + h_{[3,(n-1)]_{sys}} \delta k_{(n-1)_{sys}} = \sum_{m=1}^{n-1} h_{[3,m]_{sys}} \delta k_{sys}$$

Error amplify indicator



Error amplify indicator —Up component



Variance amplify indicator

$$\sigma^2_{[x]_{sys}} = h^2_{[1,1]_{sys}}\sigma^2_{[k_1]_{sys}} + h^2_{[1,2]_{sys}}\sigma^2_{[k_2]_{sys}} + \cdots + h^2_{[1,(n-1)]_{sys}}\sigma^2_{[k_{(n-1)}]_{sys}} = \sum_{m=1}^{n-1} h^2_{[1,m]_{sys}}\sigma^2$$

$$\sigma^2_{[y]_{sys}} = h^2_{[2,1]_{sys}}\sigma^2_{[k_1]_{sys}} + h^2_{[2,2]_{sys}}\sigma^2_{[k_2]_{sys}} + \cdots + h^2_{[2,(n-1)]_{sys}}\sigma^2_{[k_{(n-1)}]_{sys}} = \sum_{m=1}^{n-1} h^2_{[2,m]_{sys}}\sigma^2$$

$$\sigma^2_{[z]_{sys}} = h^2_{[3,1]_{sys}}\sigma^2_{[k_1]_{sys}} + h^2_{[3,2]_{sys}}\sigma^2_{[k_2]_{sys}} + \cdots + h^2_{[3,(n-1)]_{sys}}\sigma^2_{[k_{(n-1)}]_{sys}} = \sum_{m=1}^{n-1} h^2_{[3,m]_{sys}}\sigma^2$$

Variance amplify indicator

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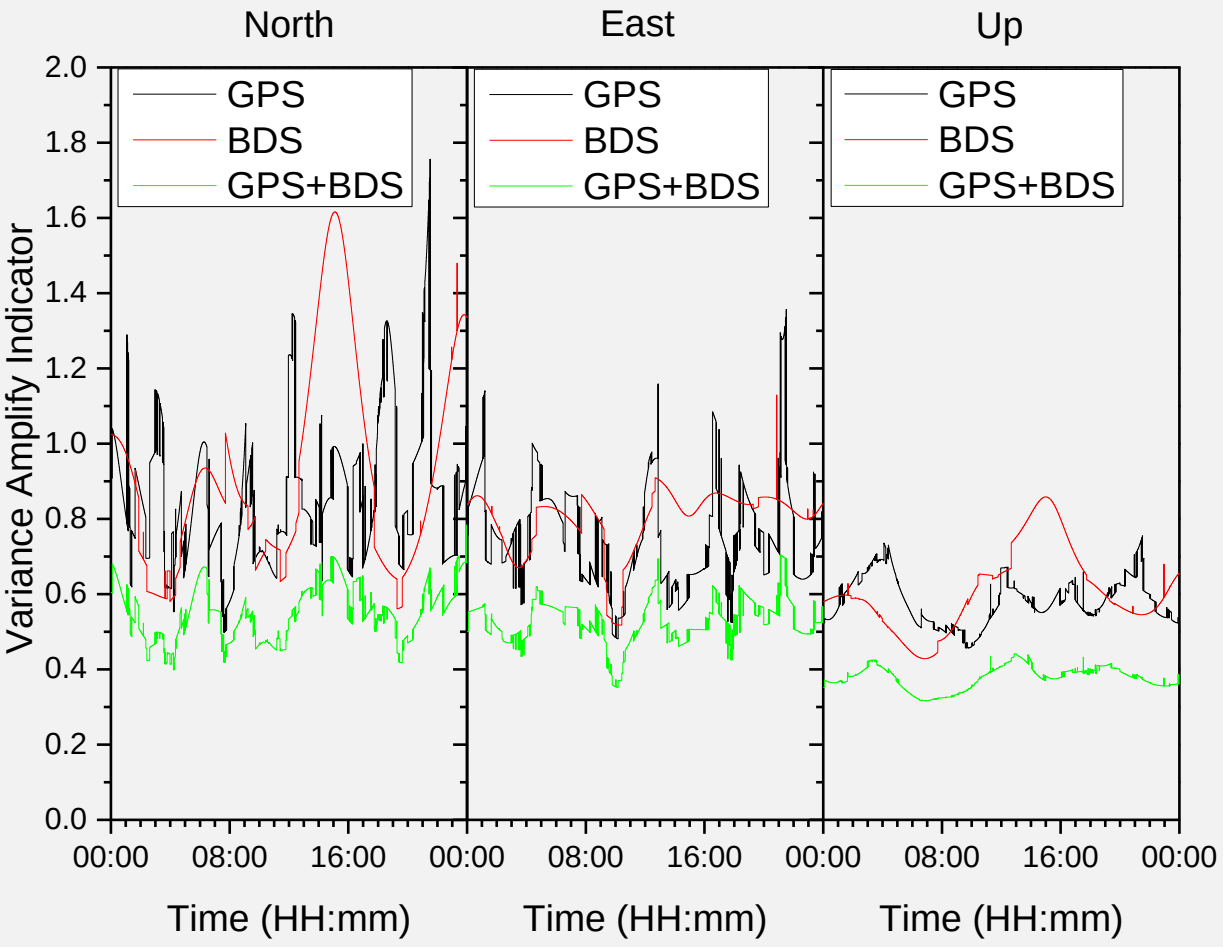
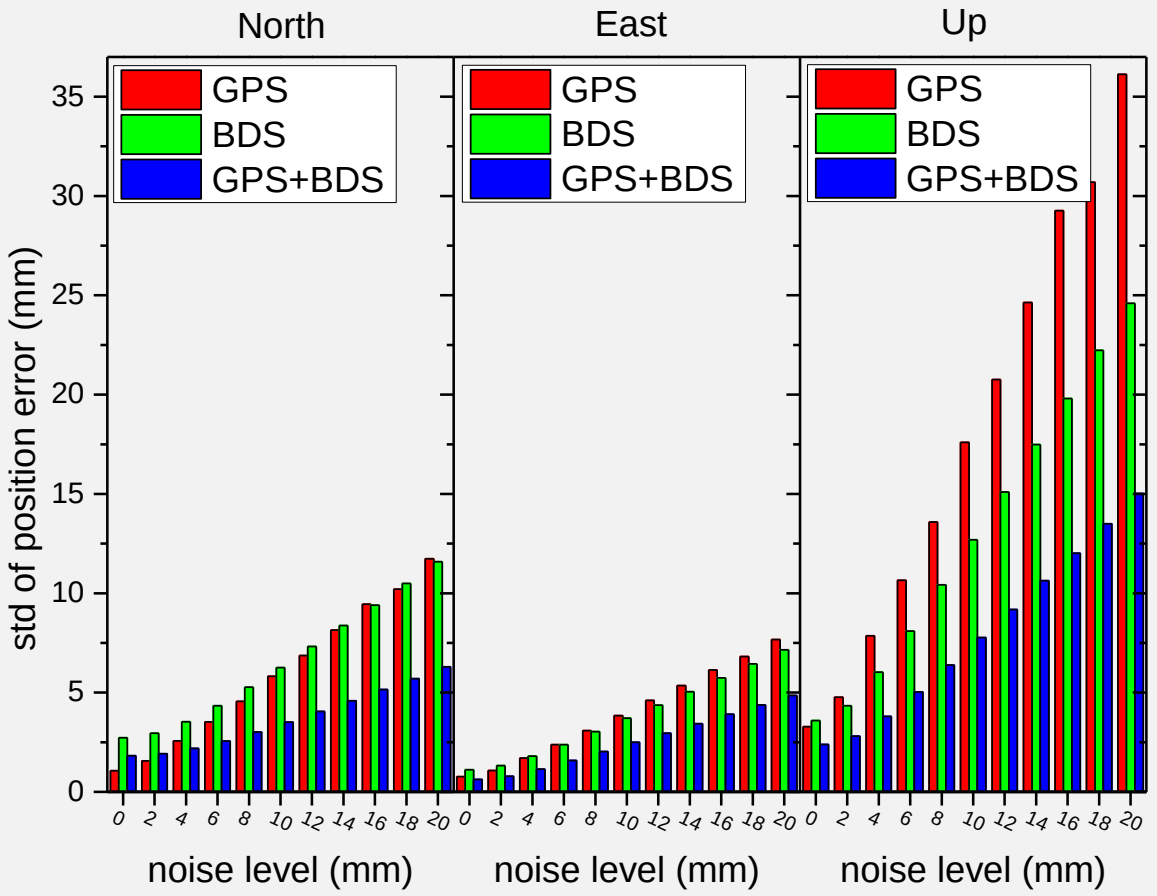


Std of position error with controlled errors



the feature of position precision with the controlled simulated noise in carrier phase measurement

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