Altimetry Derived Virtual Tide Gauge : Offshore Bangladesh

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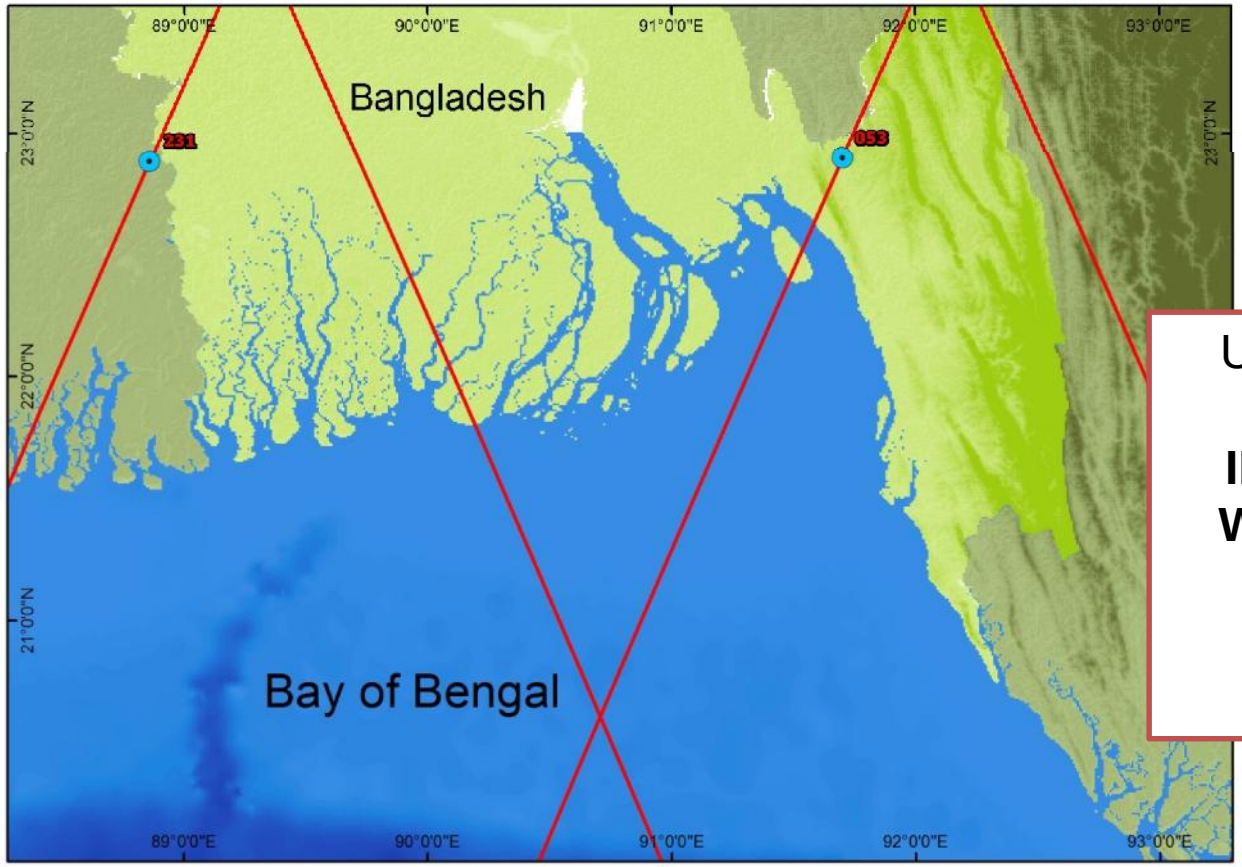

UNDER THE GUIDANCE OF

INDO - FRENCH CELL FOR WATER SCIENCES (IFCWS)
Indian Institute of Science,
Bengaluru, India

METHODOLOGY

Collection of Jason-2 (pistach) data for track no 53 with 296 cycles

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Processing and correction of satellite altimetry data

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Calculation of tidal water level from altimetry and interpolate according to virtual station

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Analysis of time series of tidal water level from Jason-2 data and calculate the tidal amplitude and phase

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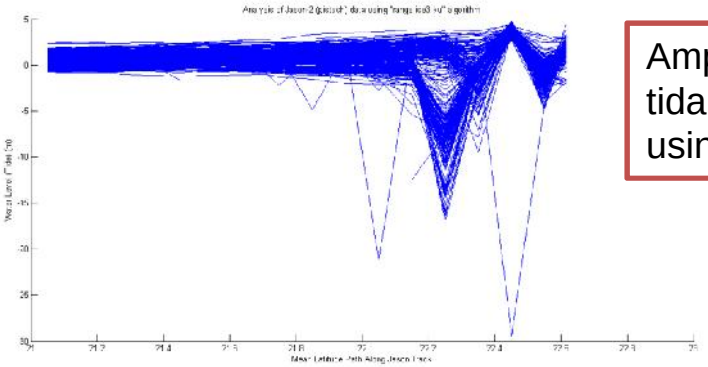
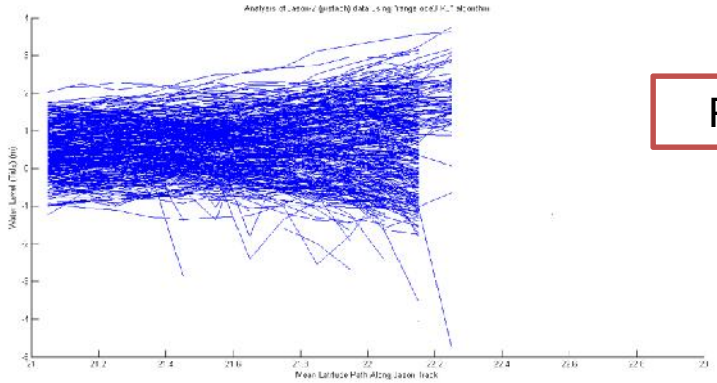
From Tidal model: Interpolate the amplitude and phase according to the virtual station

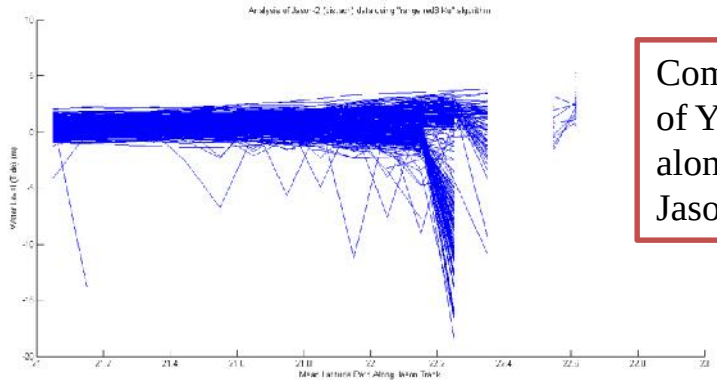
⇩

Comparison of 10 primary tidal constituents between Jason data and Tidal Model

Softwares used: Matlab, MAPS, Ferret and Detidor

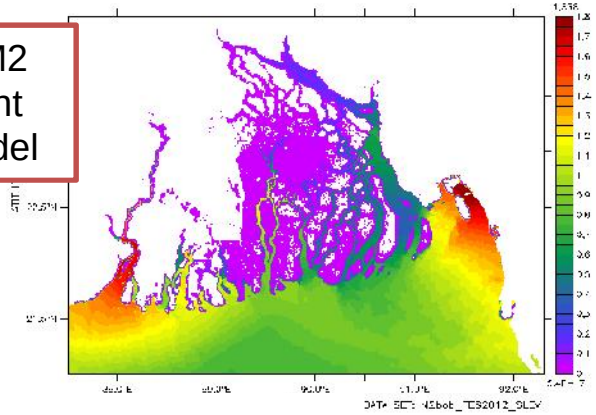




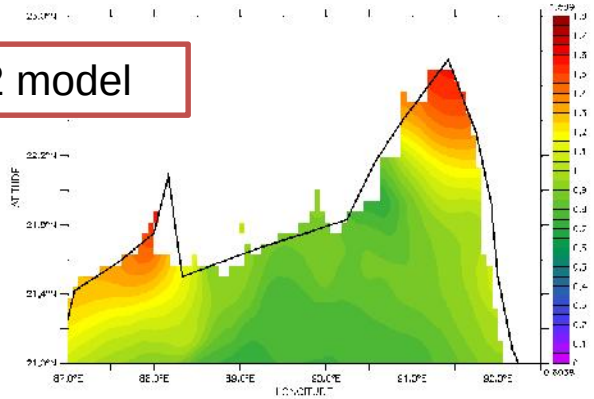


Different retracking algorithms for the analysis of Jason-2 (pistach) data

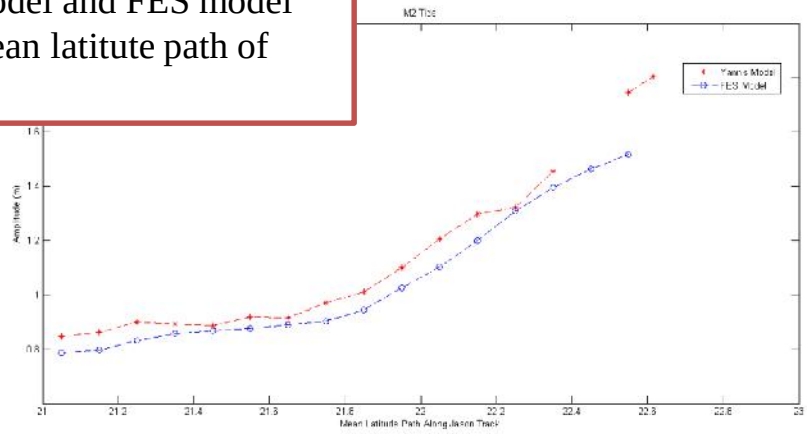
Amplitude of M2 tidal component using tidal model



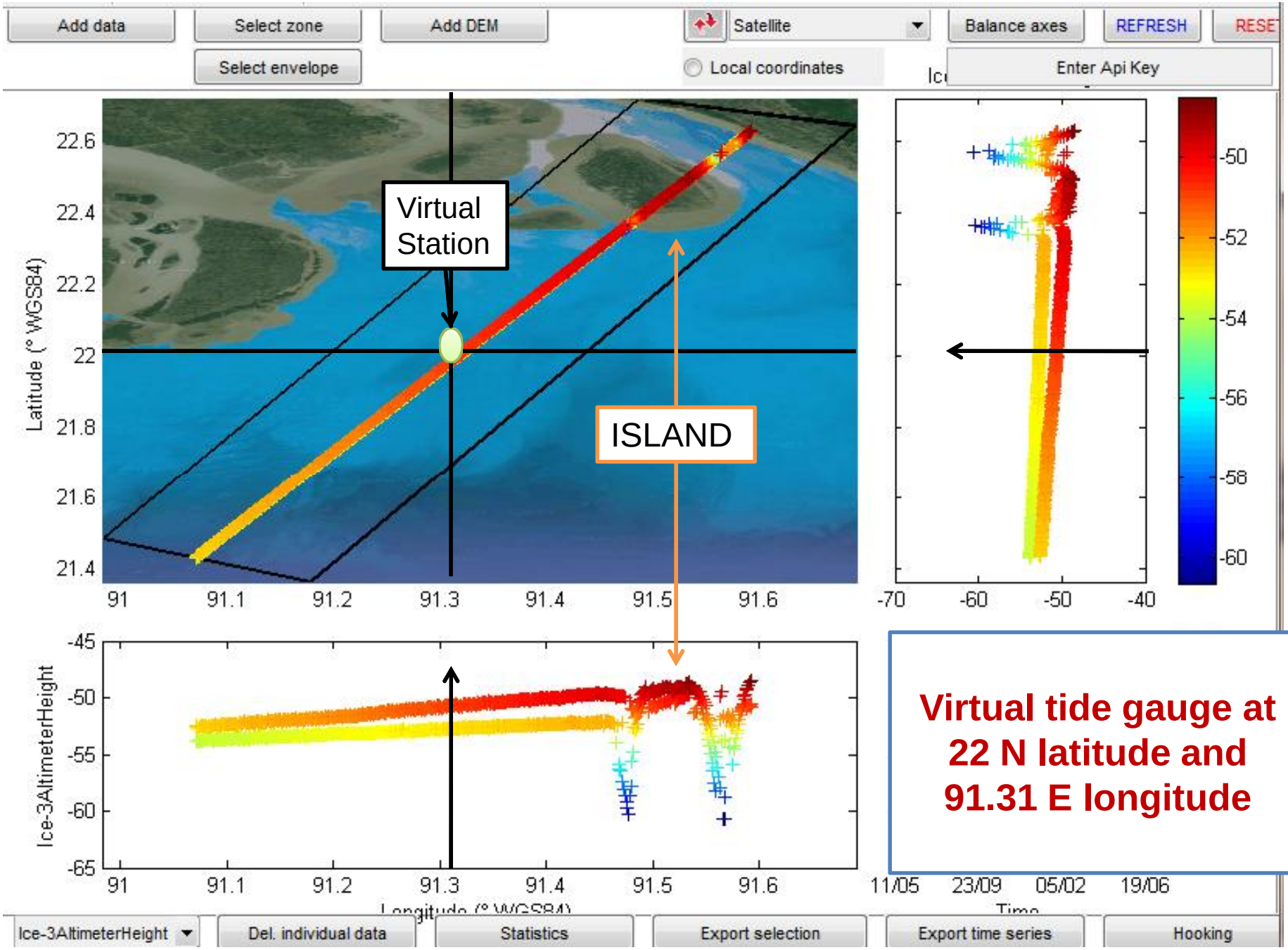
FES2012 model



Comparison of M2 tidal amplitude of Yann's model and FES model along the mean latitute path of Jason track

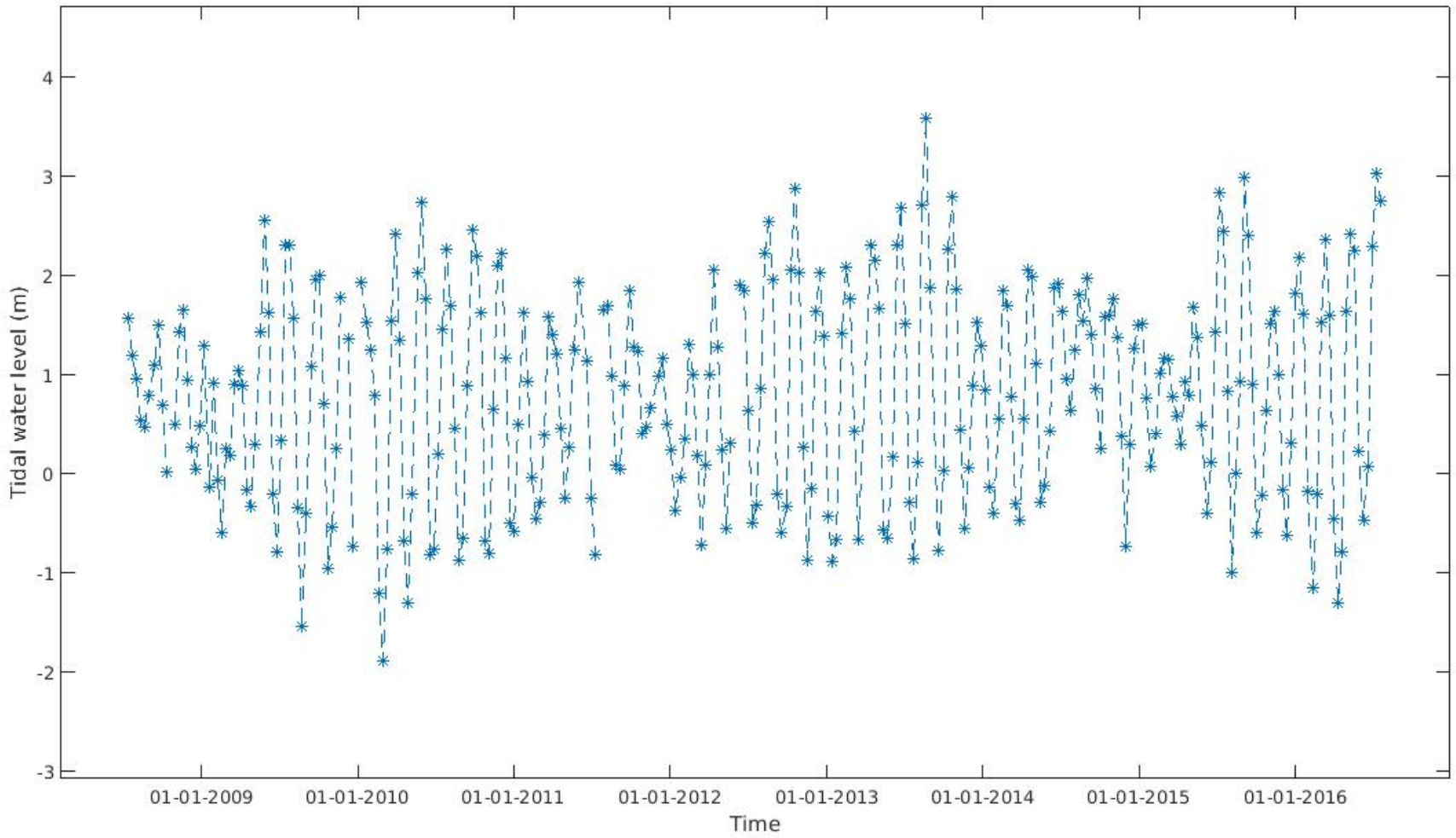


Dhaka
Tripura
Agartala
Bengal
231
053
Mizoram
Khulna
Chittagong Division
Kolkata
Chin Hills
Barisal Division
Chittagong
JASON 53
TRACK
(296 cycles)
US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2016 Google
Image Landsat
Imagery Date: 12/14/2015 22°07'16.34" N 90°36'56.84" E elev 1 ft

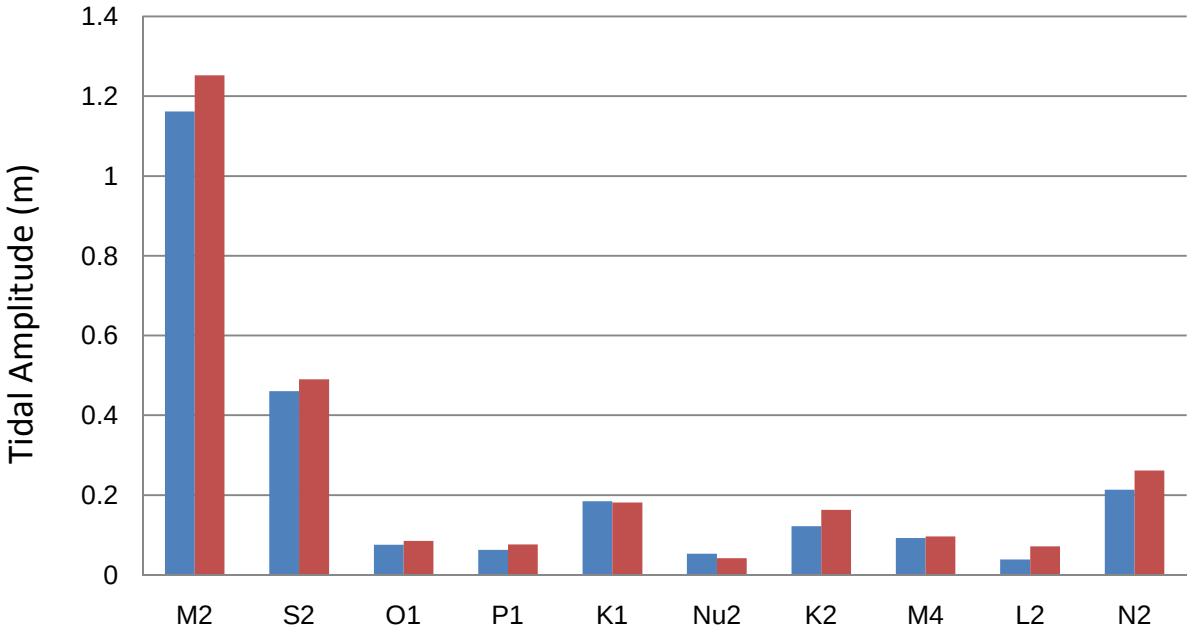


Virtual tide gauge at 22 N latitude and 91.31 E longitude

Time series of tidal water level from Jason-2 data



Calculation of tidal water level = altimeter height - range - (propagation correction + geophysical correction) - geoid



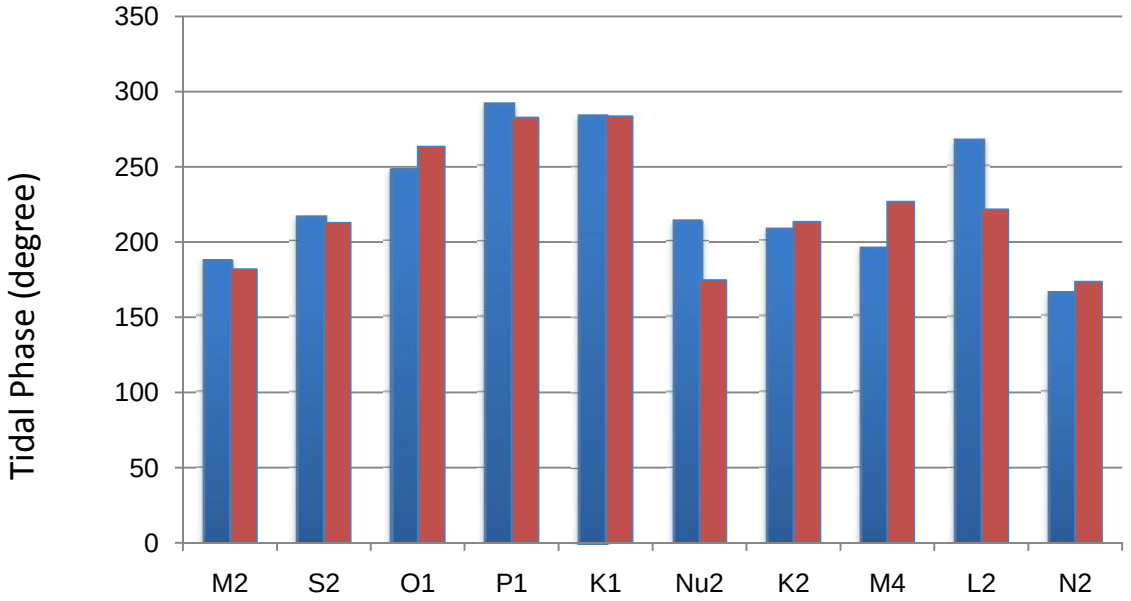
Comparison between

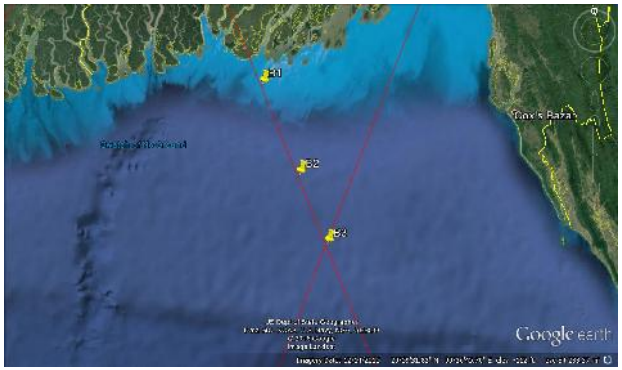
Jason-2 Data

and

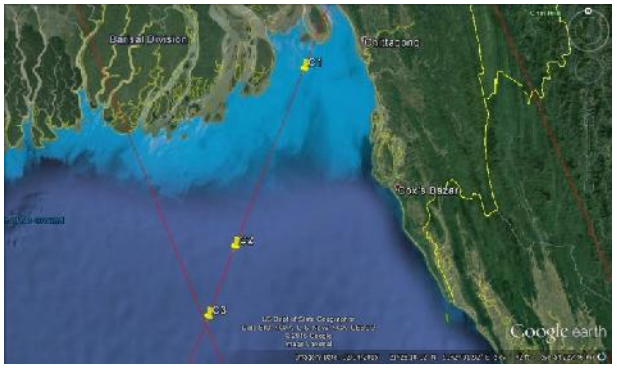
Tidal Model

For each tidal component (e.g., M2) = amplitude (M2) × cos (wt + phase (M2))

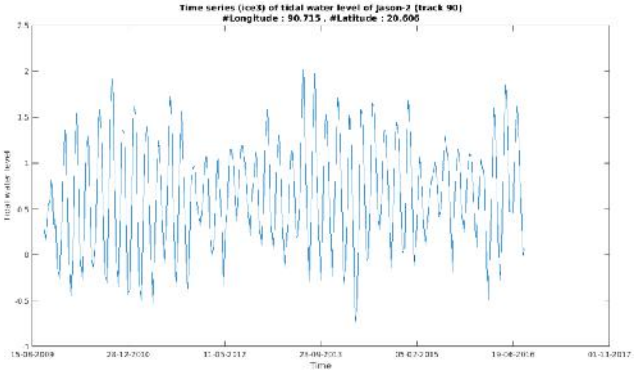




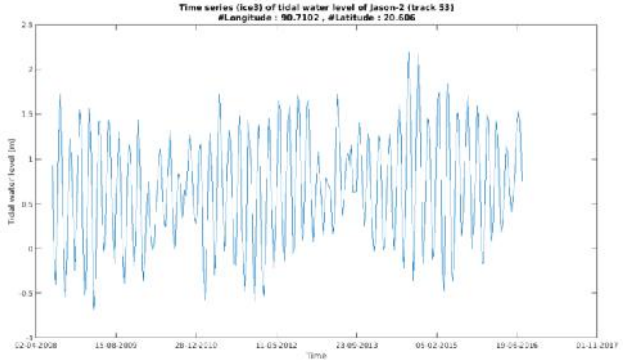
Google earth image of track 90



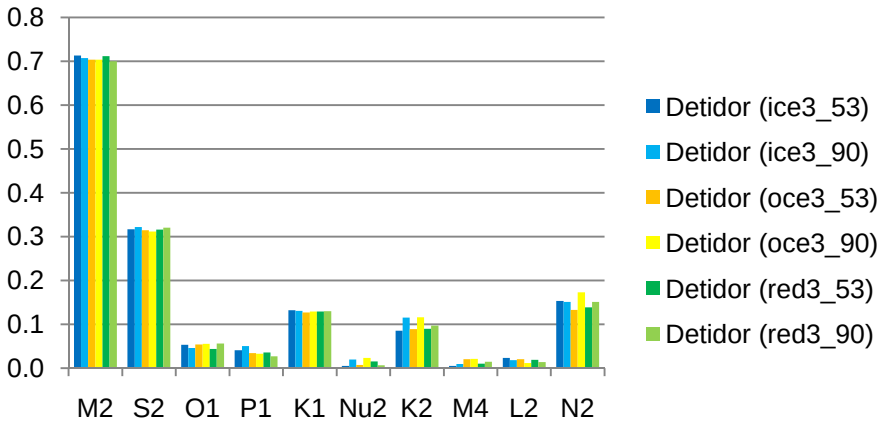
Google earth image of track 53



Time series of tidal water level at 20.606 lat, 90.715 lon (B3)

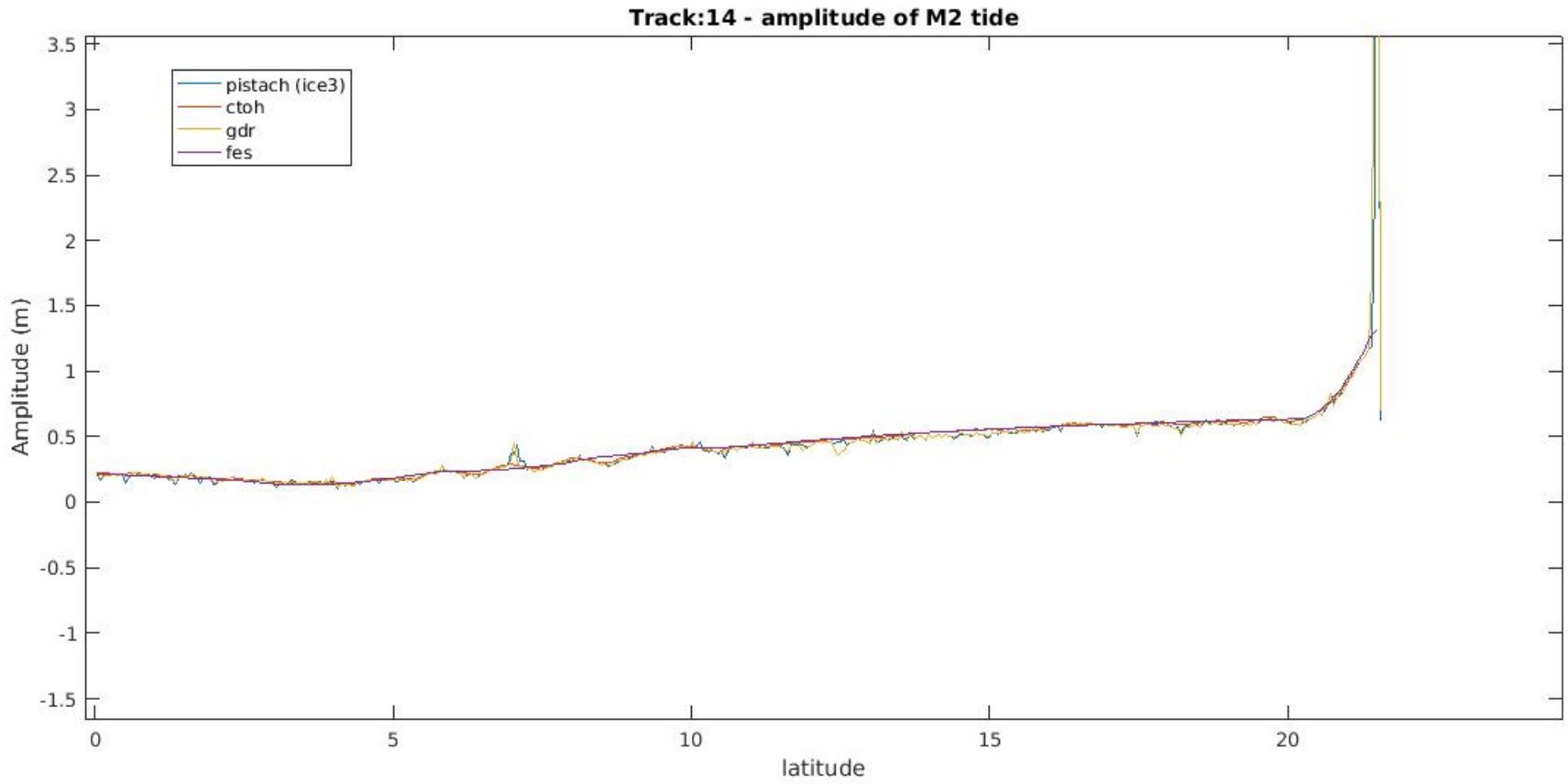


Time series of tidal water level at 20.606 lat, 90.7102 lon (C3)



Comparison of tidal amplitude between track 53 and track 90 at intersection point (C3 and B3)

Comparison of M2 tidal amplitude among different Jason-2 products and FES model



THANK YOU