Assessment of the performance of EIGEN-6C4 via GNSS/leveling data over Vietnam

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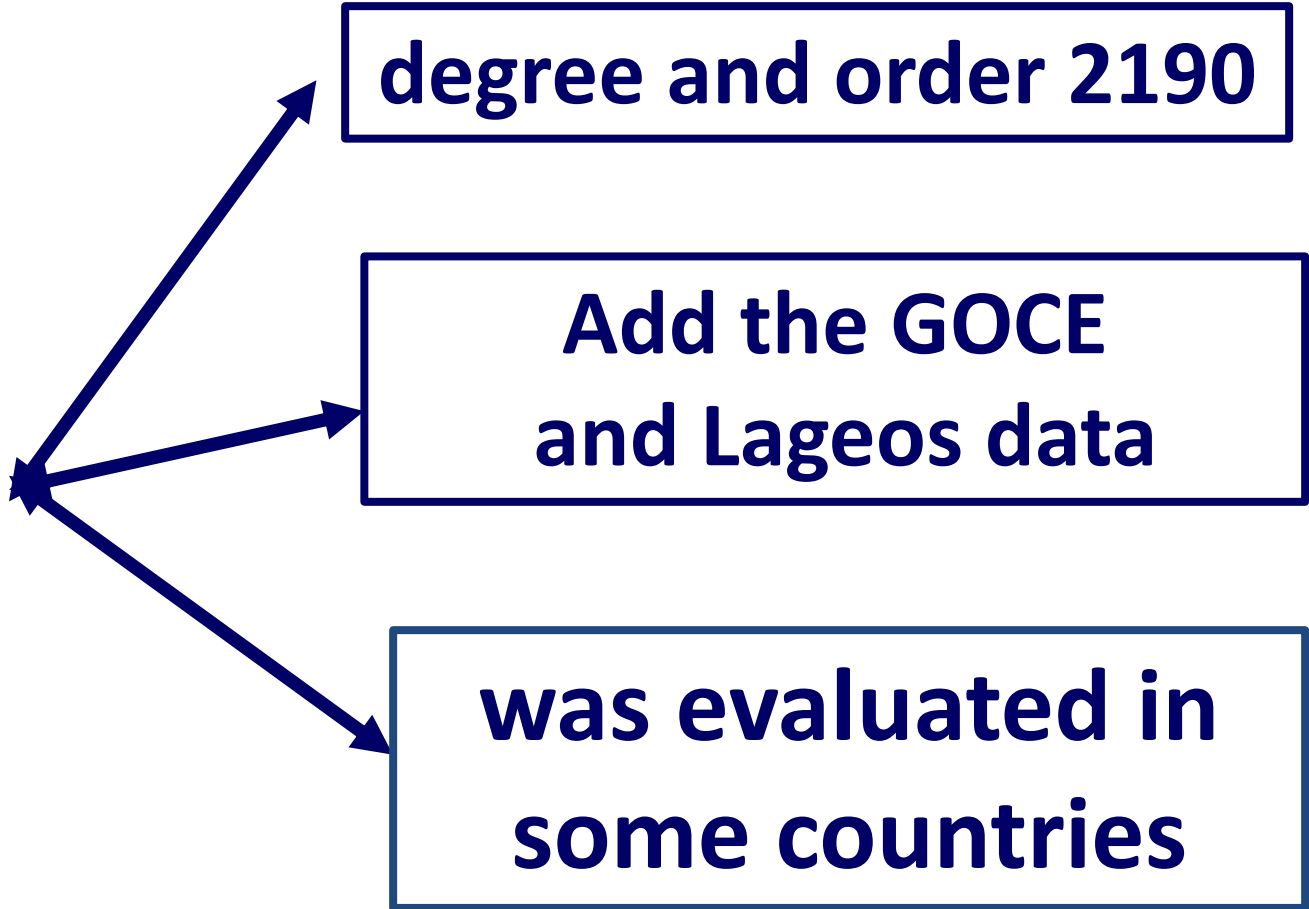
Contents

1.

Introduction

Introduction

EIGEN-6C4

degree and order 2190

Add the GOCE
and Lageos data

was evaluated in
some countries

Introduction

GNSS/leveling validation

EIGEN-6C4 is **slight better** than **EGM2008** except Czech and Aegean

Gravity validation

less published, the **outstanding of EIGEN-6C4** over **EGM2008** is **not clear**

Introduction

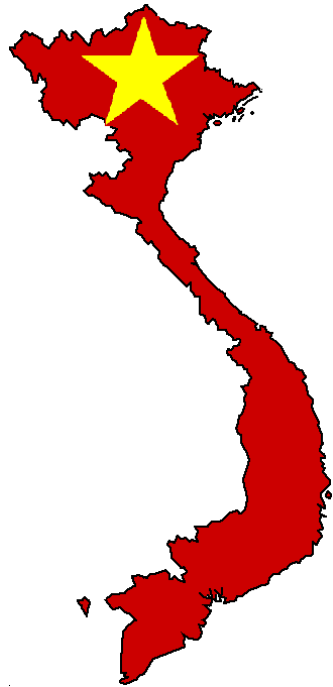GNSS/leveling

validation

for

OSU91A, EGM96, GM2008:

EGM2008 is the **best,**

more **widely used**

Never for

EIGEN6C4

????????

Introduction

The performance of

EIGEN6C

via GNSS/le

absolute and

comparision

2.

Method

Method

Height anomalies derived from EIGEN6C4

Height anomalies derived from GNSS/levling

absolute and relative comparision

Method

Absolute comparision

$$\Delta\zeta = \zeta_{\text{GNSS/leveling}} - \zeta_{\text{model}}$$

$$m_{\Delta\zeta} = \pm\sqrt{\frac{[\Delta\zeta'\Delta\zeta']}{n-1}}$$

$$\Delta\zeta_{TB} = \frac{1}{n}\sum_{j=1}^{n}\Delta\zeta_j$$

$$\Delta\zeta_j^{/} = \Delta\zeta_j - \Delta\zeta_{TB}$$

Relative comparision

$$\delta/_{\text{baseline}} = \Delta\zeta_{\text{GNSS/levelling}} - \Delta\zeta_{\text{model}}$$

$$\delta_{/1km} = \pm\sqrt{\frac{P\delta\delta}{n-1}}$$

$$P = \frac{1}{D}$$

3.

Input solution datasets

Input solution datasets

GNSS/levelling

818 points regularly

covering in Vienam

surveyed by

DOSMG of Vietnam

with the aim to

build local quasigeoid

tied to WGS84

EIGEN6C4, EGM2008

computed from

ICGEM web

Height anomalies of

818 GNSS/leveling points

were interpolated

using Collocation

tied to WGS84

4.

Results and dicussion

Absolute evaluation

Areas	GGMs	Root mean square $(m_{\Delta\zeta},m)$
Entire	EGM2008	0.2867
Vietnam	EIGEN-6C4	0.1895
Northern	EGM2008	0.3731
Vietnam	EIGEN-6C4	0.2461
Central	EGM2008	0.2456
Vietnam	EIGEN-6C4	0.1778
Southern	EGM2008	0.1842
Vietnam	EIGEN-6C4	0.1137

Absolute evaluation

EIGEN-6C4

outperform

EGM2008

reduces from northern
to southern area

is remarkable in northern part
which is the highest and
roughest area

related to characteristics
of topography
in surveying areas.

Relative evaluation

The baselines is divided into groups
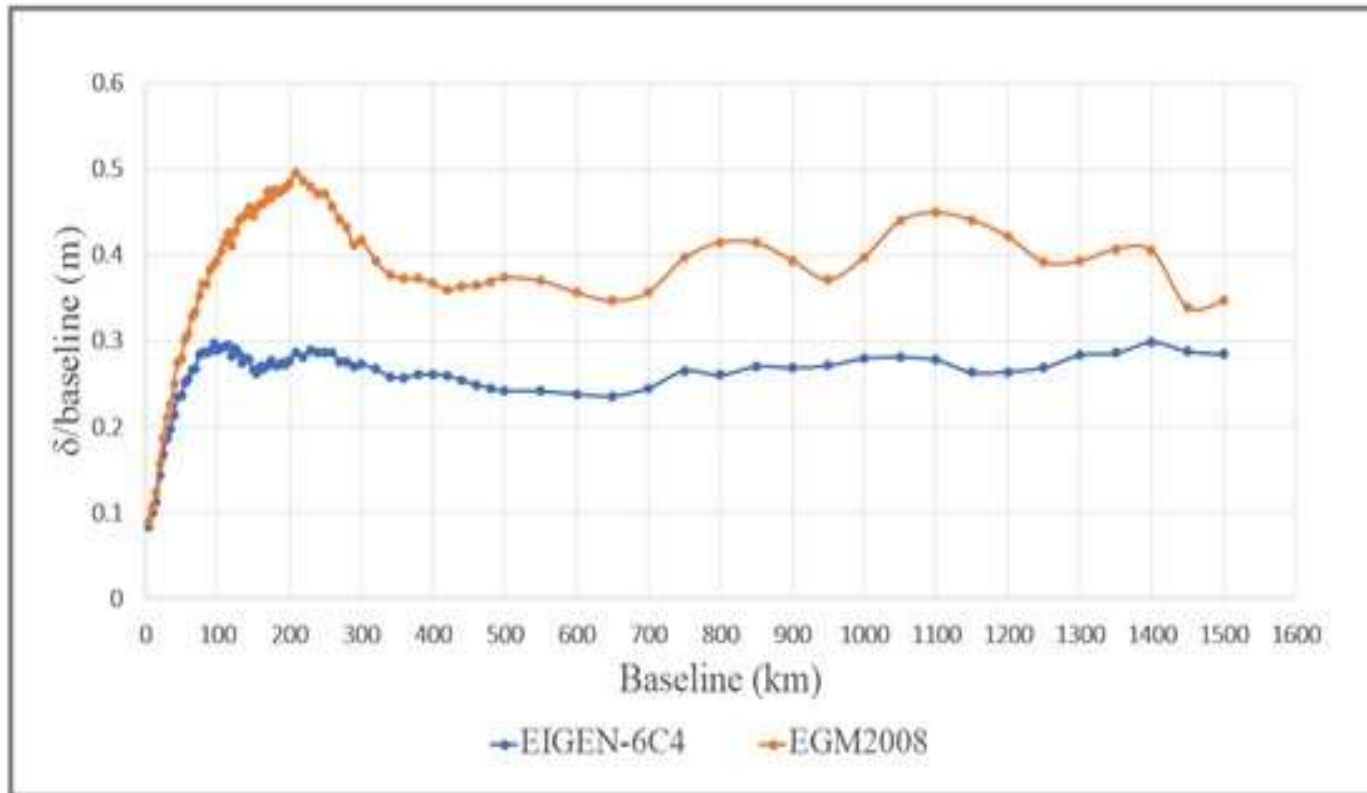
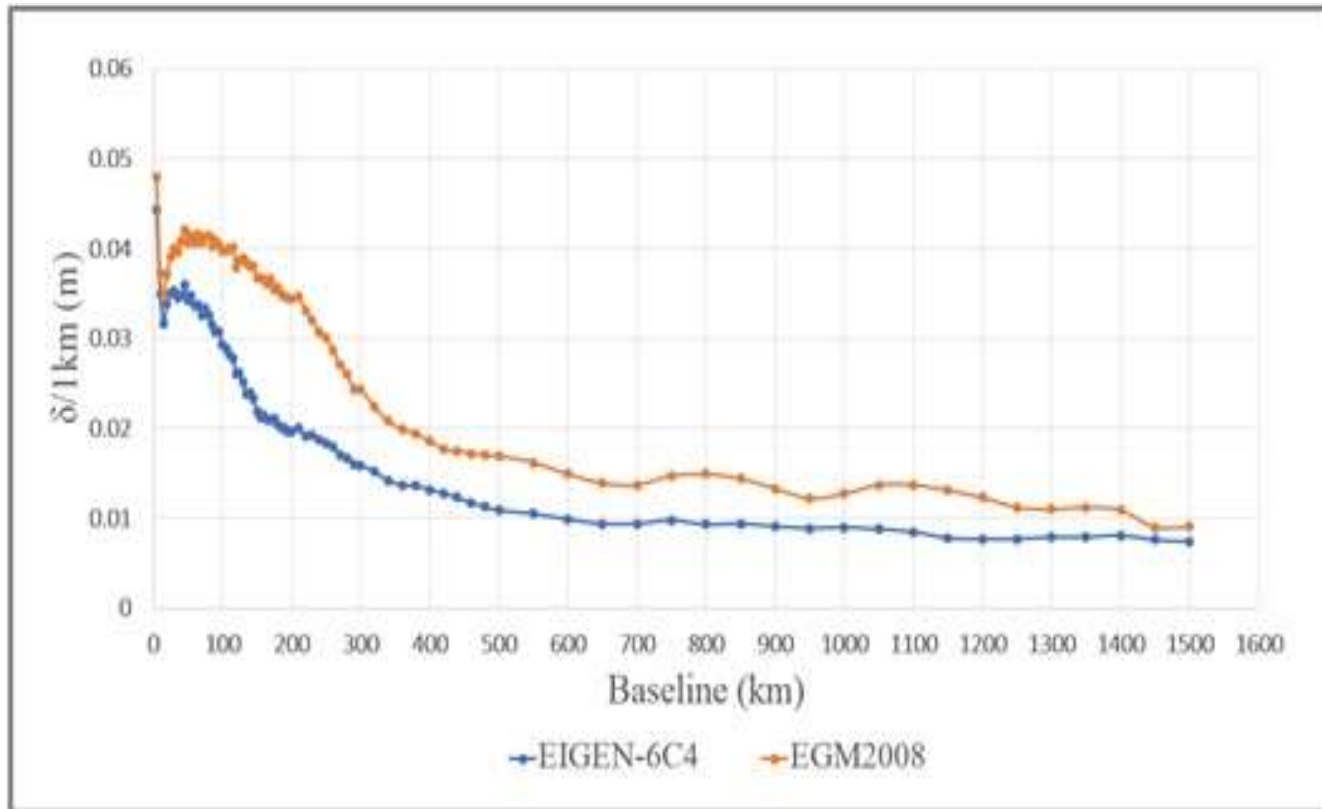lengths varies from

0km to 5km

5km to 10km

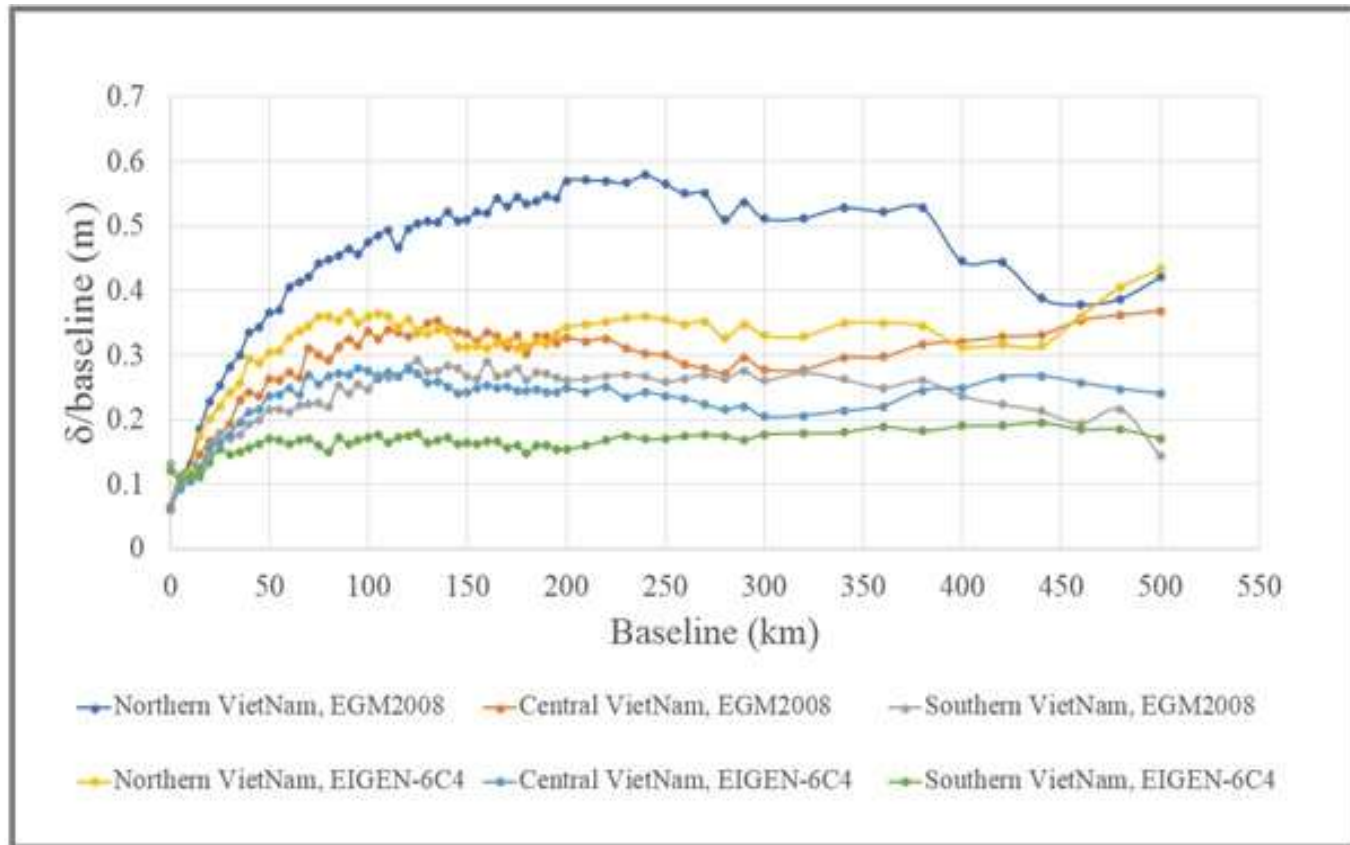10km….15km

…………………

1495km to 1500km

Relative evaluation

The values of $\delta/_{baseline}$
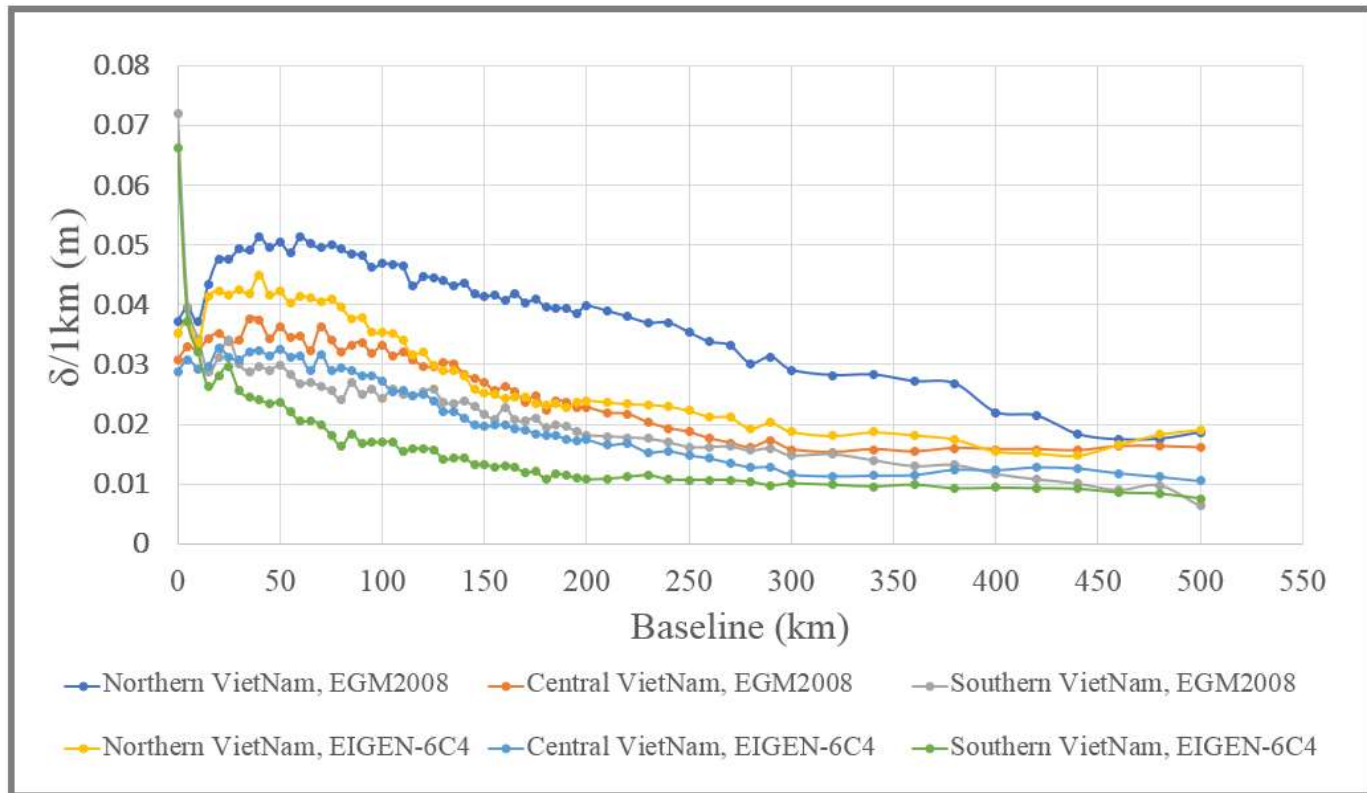**for the entire mainland of VietNam**

Relative evaluation

The values of $\delta/_{1km}$
for the entire mainland of VietNam

Relative evaluation

The values of $\delta/_{baseline}$
for separate areas in VietNam

Relative evaluation

The values of   δ/1km for separate areas in VietNam

Relative evaluation

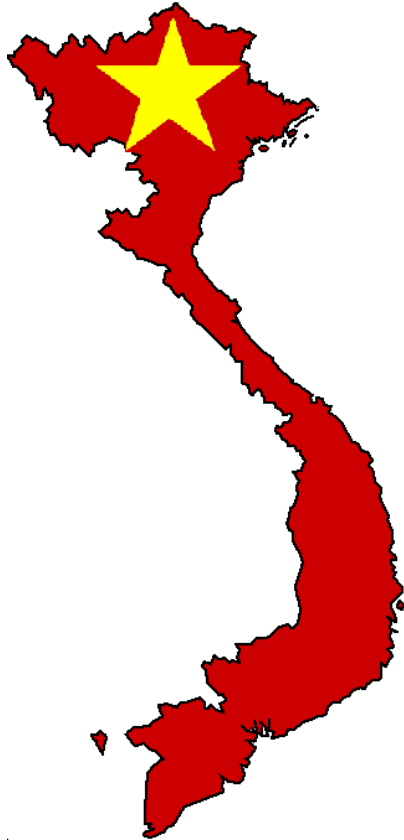**EIGEN-6C4**

outperform

EGM2008

δ/baseline and δ/km respect to EIGEN-6C4 is smaller and more stable than that of EGM2008

δ/baseline and δ/1km in northern area are quite large compare to other regions

5.
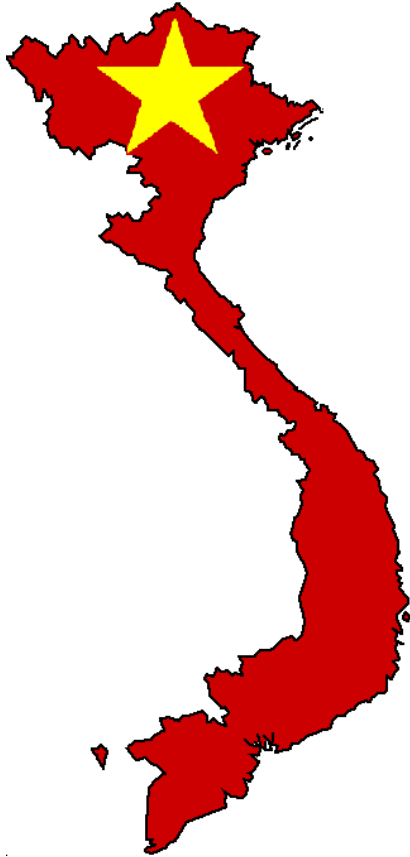
Conclusion

Conclusion

EIGEN-6C4

outperform

EGM2008

in term of height anomalies for both absolute and relative evaluation

related to topography condition

Conclusion

EGM2008 should be

replaced by EIGEN-6C4

for practical purposes

related to height anomalies

Thank you for your listening