Overview and general recommendation

This paper provides an InSAR Kinematic Modelling based on a reliable and widely used approach(TDEFNODE). As reported by the authors, this model has been applied in the study zone but is limited to GPS/GNSS data. The relevant point is the joint inversion of GNSS and InSAR velocities. The authors present all the expected elements for a manuscript like this. After a detailed review of the manuscript, I consider the paper suitable for publication, but it will require minor corrections, as outlined in the following comments.

General comments:

The abstract, introduction, data and methodology, strain rate field, kinematic results, discussion, and conclusions are generally well written; however, minor comments are outlined in the next section as suggestions for the authors' consideration. In my view, probably, the inversion strategy is one of the most interesting contributions of this paper. However, I note a lack of revision of similar strategies of joint inversion by other authors (ex Wu et al. https://doi.org/10.1029/2023GL106143.

Minor comments:

L. 34. It's correct NW-SE instead east to west?.

Figure 1. CHORT (in the caption)- is shown in the figure as CHOR. Motions instead of motion. I suggest using a different color bar for FM solutions. 1 arcsec instead of arc. sec.

L.57. Figure 1 shows 13 mm/yr.

L.63. Cocos and North American plates.

L.65 translated *into*.

L.81. based *on* GNSS

L. 82. Staller (2014) "created". The use of this verb sounds rare.

L.89. "without including" instead of excluding or maybe another sentence more gentle.

L.96. Data and *methodology*.

L. 106. GNSS time series *accounting for*

Figure 2. "mm/yr" for BC figures.

L. 130. Guatemala.

L.149. "mark" instead of represent

L.157. Our models are fed by

L 161. (S=ΦV) italic?

L. 164. In the TDEFNODE, tectonic blocks are imagined as polygons limited by faults or free borders (McCaffrey, 2002; Meade et al., 2002).

L. 175. The crustal fault nodes,

L.180. In the text and figures, we found CHOR, CHORT. To review the uniformity in the whole manuscript.

Figure 3. To revise the grammar of the sentence in the caption “The CSAL block, together with Af and Bf faults appear with an asterisk,--”

L. 230 “ a predominance of NE-SW extension around the ESFZ, ~~and~~ ... , ~~which is~~ consistent with Staller (2014).

L.237. Table 1**,** and Supplement...

Table 1. “Plus sign” instead of Positive.

L. 280. We generally obtain..

L. 281. Remain instead fo exist.

L. 283. We deem it

L. 295. Rewrite the sentence. “Causes the biggest difference” sounds uncommon.

L. 308. North.

L. 315. They show, ~~thus,~~

L. 324. with high uncertainty

L. 326. ..dip nearly vertically.

L.328. We use ~~for our model~~ an average dip of 80º for faults within the ESFZ in our model.

L. 334. appears to be *predominantly* random in space,

L. 350. ...this single *accounts* for

L. 360. To revise the meaning of the sentence. Maybe: “...ESFZ decrease in strength...”

L. 363. In areas where ~~there is~~ no clearly dominant fault accumulates deformation, ...

L. 374. To constrain its kinematics robustly.

Figure 6. (fault-parallel, fault-orthogonal)

L. 413. , the imposed creep

L. 425. …match the observed one better,

L. 435. Another ~~factor to consider as a~~ potential source

L. 443. … than half are based on episodic

L. 448 … and we do not have the resolution to resolve this issue using geodetic measurements.

L- 480. Additionally, we ~~also~~ test the

L. 495. Since deformation can accumulate …

Figure 8. data, and the mean.