Dear Editor,

Thank you for handling also this second round of revisions. All revisions were very constructive and helped further improving the manuscript. We implemented all suggested changes.

In particular, following Reviewer #2, a part for all minor changes, we modified the text to better comment the validity of the definition of the centre of the caldera, its relation with the present state of the caldera, and its representativeness for future vent opening. This lead to the addition of a couple of sentences in Section 2 (Methods, lines 84-90 in the track/change version) and Section 3 (Results, lines 110-114), the revision of several misleading sentences (section 3.1 in lines 128-130 and 143, in section 5 line 267), as well as the integration of few new references. We also added a sensitivity test on the definition of the centre (Section 3, lines 119-121, 135, 148-149, and Supplementary Figures 1 and 3).

Following Reviewer #1, we corrected the list of references and we added in Section 5 (Discussion, lines 287-291) a comment about the potential future developments regarding a potential short-term dynamic correlation between azimuthal distribution and vent opening.

All line numbers are reported with reference to the track-change version. Below, you can find all detailed answers to all reviewers' comments.

My best,

Jacopo Selva

Reviewer #1

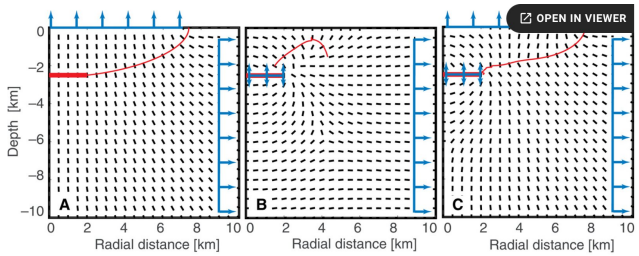
Dear Editor, I have read the revised version of the manuscript and the related revision files. I appreciate the effort of the Authors in addressing all the raised points in the first round of revision. I believe the manuscript is now much more structured and flowing. I also see that the comparison with the existing maps has been satisfactorily addressed, and I have to say, strengthened the relevance of this work. I praise the effort of the Authors in clarifying all the raised points and improving the technical description, which is now very clear. Below, I report minor suggestions and corrections that will help reach a final version of the work. I believe it can be accepted after the	*We thank the reviewer again for this second very constructive review. We implemented all suggested changes.*

implementation of these minor recommendations. Best regards	
Literature referencing: Basically, all the references within brackets are missing the comma after “et al.”; ensure they are correct: e.g, Monaco et al., 2022.	*Corrected, thanks*
At least nine references are reported in the reference list but are not cited in the main text, or are duplicated in the reference list. Ensure these references are added to the main text or deleted from the reference list. Berberi et al., 1984, not cited in the text Bevilacqua et al., 2024, duplicated reference Buono et al., 2022, not cited in the text Chiodini et al., 2021, not cited in the text D’Antonio et al., 2007, not cited in the text Giudicepietro et al., 2025, not cited in the text Isaia et al., 2009, not cited in the text Osservatorio Vesuviano, 2025, not cited in the text Smith et al., 2011, not cited in the text Double-check all the references	*Thank you for this. We corrected these references and we reviewed all the list, correcting several mistakes..*
Line 35: the correct reference is Vitale and Natale, 2023	*Corrected, thanks*
Line 37: I suggest replacing “more than 1m” with “almost 2 m” since both uplift episodes reached about 1.7 m each.	*We agree, corrected*
Figure 1: Caption, replace “Toponymic” with “Topographic” Make the cross of the point of maximum uplift bigger or in black to make it more visible	*Corrected, thanks.*
Line 65: add topographic to “peak”	*Added, thanks. We added also “probability peak” in the previous line.*
Line 79: I suggest rephrasing the end of the sentence to “stress distribution within the caldera” as it seems more appropriate.	*Corrected*
Line 98: replace topographical with “topographic”	*Corrected*
Line 102: In UTM projections, coordinates are not in longitude and latitude but should be referred to as Easting and Northing, respectively. The same applies to Line 165	*Corrected, thanks*

Line 104: choose between angle or azimuth, I suggest using azimuth.	*Corrected. We now use only azimuth*
Line 104: distance from the centre, without "-"	*Corrected*
Lin 140: I suggest replacing during with throughout	*Corrected, thanks*
Line 142: the La Starza terrace locality is located towards NW, not NE, maybe the Authors refers to La Pietra?	*We now put Accademia and La Pietra area*
Figure 2: An interesting further development would be to model an interactive topography. For instance, there are currently considered topographic peaks potentially affecting the probability maps of older Epochs due to younger vents. e.g., the peak related to Capo Miseno or Nisida (3.9 ka) for the Epoch 1 (14.5-10.6 ka) vents. I see that then the Epochs 1 and 2 are not considered, but still, the varying morphology due to the eruptive centres formation could be a stimulating development of the model.	*We agree. We added a comment in the discussion about this in lines 287-291:* *"Regarding the azimuth distribution, we found that the correlation between azimuth and topographic peaks is instead stable across epochs and is maximized considering the topographic peaks within 7 km from the caldera centre, demonstrating that the topography surrounding the caldera may be a good proxy for vent forecasting. In the future, this relationship may be better explored at different scales in space and time, studying for example the potential effects of the varying spatio-temporal morphology due to eruption history, or the impact of different positions of the magma source."*
Line 179: Reference to Supplementary Figure 6, add "a" and "b" in this figure, and place a vertical line in correspondence with the most appropriate values	*Added*
Line 210: specify that these panels are from Figure 4	*Added, thanks*
Line 210: What is N within brackets?	*It is North. We added "toward"*
Line 214: maps published in literature	*Added, thanks*
Line 218: see comment to line 142	*Corrected, thanks*
Figure 4: Correct in panels A, D, and caption: Alberico, not Albertico. Also, correct in panels H and I, rims and not rings or rins	*Corrected, thanks*

Reviewer #2

The manuscript describes a method to determine the likelihood of the next Campi Flegrei vent opening location, based on the distributions of past vents from the caldera centre, using the azimuth and distance of those vents as model input. The model also considers topographic focussing as suggested by Rivalta (2019). I found the paper to be clearly written and logically laid out with adequate illustration.	*We thank the reviewer for this very constructive revision. We tried to implement all suggestions, as better discussed below.*
My general comments concern the validity of the definition of the centre of the caldera. Choosing the max uplift location as the caldera centre assumes that uplift is associated with the magmatic system. What is the relationship of the centre of uplift to geophysical images of present-day magma location? Where would the "centre" of the caldera be interpreted from those images?	*Thank you for this comment. As we now note at the beginning of Section 3, "At Campi Flegrei, an oblate central pressurized melt zone located at the center of the caldera is compatible with many geophysical evidences (e.g. Barberi et al., 1991; Capuano et al. 2013; Castaldo et al. 2021; De Leandro et al. 2025). Inflation of a caldera-centered oblate spheroidal magma chamber at a depth of ~3.5 km is consistent with the deformation in the last ~600 years at least (Di Vito et al. 2016, D'Auria et al. 2015, Amoruso et al. 2007, 2014), and a similar source is likely active at least in the last 5 ka (Di Vito et al. 2016; Rivalta et al. 2019)."*
The caldera centre also assumes dyke propagation arises from the middle of the reservoir, but stress models (e.g. Gregg et al 2012) often show that dyke propagation from the edge of the reservoir is a more favourable location.	*Thank you for this very important comment. It is true, indeed we do not assume a propagation from the center of the caldera. As shown in Rivalta et al. (2019, see for example Fig. 1, reported below), in a caldera with a radial symmetry (panels A and C), dykes propagate radially from the edge of a finite symmetrical source at the center of the caldera.* *Indeed, we are not assuming that the propagation is from the center, but simply that it has a radial symmetry. We now specify this in Section 2 (Method), lines 84-89: "In other words, Rivalta et al. (2019) demonstrate that in an approximately symmetric caldera with a given magma source located around the centre of the caldera, independently of its specific depth and size, we expect a symmetrical radial dyke propagation from source, and with preferred directions controlled by local factors. The empirical track of these features may be retrieved by studying the distribution of past*

	vents around the caldera centre, being this position not necessarily the origin point for dykes, , which may indeed detach from the edge of the source (Gregg et al. 2012; Rivalta et al. 2019), but simply the reference for tracking the radial symmetry. ” *We also removed two misleading sentences in section 3.1 (lines 128-130 and 143), and reviewed one sentence in section 5 (Conclusions, line 267), in order to avoid misleading messages.*  **Fig. 1 Numerical Finite Elements (FE) models of principal stress orientation and resulting magma trajectories.** σ_3 is represented by the black segments, the thick red line represents the location of a sill-shaped pressurized melt lens, and the thin red lines represent σ_3-orthogonal streamlines. (**A**) “Unloading scenario” where we applied 9 MPa of vertically oriented tensional stress due to overburden removal (blue arrows). (**B**) “Inflating sill scenario” where we applied 5 MPa pressure to a thin flat cavity. (**C**) “Unloading + inflating sill” scenario where we combined the two previous cases. We added a weak (1 MPa) horizontal stretching to all models.
In other words what is the sensitivity of your model to the position of the centre of the caldera from which dyke growth occurs.	*As reported in Section 3 (lines 119-121), we added a sensitivity test to the specific choice of the geometrical center, addition new figures in the Supplementary Material (Supplementary Figures 1 and 3), and we now comment that the results are stable with respect to this choice (lines 135 and 148-149)_*
Finally, how valid is the present-day centre of the caldera for assessing the location of the past eruptive centres? During the different eruption epochs, it seems feasible that the magma reservoir (caldera) centre (inferred at present to be under the max uplift) – could have been in different locations. Please comments on this in your text. How would this relate to your resultsvof distributions presented in paragraph line 112-126. Could a different caldera centre location explain the difference you describe in paragraph line 169 for Epoch1 and 2?	*Thank you for this comment. As discussed in the previsous asnwers, now at the beginning of Section 3 it is specified that a source centered at the center of the caldera is consistent with the present deformation and with the one of the last ~600 years at least, and that a similar source it is likely active at least in the last 5 ka.* *This is may indeed be at the base of the significant differences between Epoch 3 and previous Epochs. This is now noted in the conclusions (lines 282-283)*
Specific points Line 46 – why especially in calderas? Is it	*Yes, but it is true that is relevant also at central volcanoes, so we deleted it.*

because the vent location is uncertain?	
Line 106 impact ON all statistical analysis	*Corrected, thanks.*
Line 163 - clarify the significance of they hypothesis of equal distribution – i.e. what does it mean?	*Corrected thanks. We now better explain that this means that the distributions of distances are equal in the different directions (with different azimuth), and thus azimuth and distance are independent.*
The first paragraph of the discussion reads more like a description of the results.	*It is true. We now moved this paragraph to the previous section.*
Line 208. By “outer ring” do you mean the “outer high probability region”? You don’t mention what these rings are but then refer to them as rings.	*Thank you. We now clarify this here and in the following lines.*
Paragraph, line 198. Does a relative difference =1 indicate they are complete different or the same? Please explain the scale.	*Thank you for this comment. We now specify it in the caption.*
Figures Figure 1. The shading on the DEM is confusing, are dark colours low or high elevation? Preference is low = dark, high = light. Point of max uplift is small and hard to see. Colour code the caldera rims to their appropriate epoch – as for the vent locations.	*This is a Google maps standard, so we could not change it, but we now specify it in the caption.* *We increased the size of the point.* *All rims are older than vents, and all were active during the two main caldera collapses related to the Neapolitan Yellow Tuff and the Campanian Ignimbrite eruptions (Natale et al. 2022)*
Figure 3, given the importance of topography in stress localisation, it might be better to show the DEM as the basemap in this figure, rather than the road map.	*In the previous round, reviewers asked to remove the shading to better highlight the probability map. We think that they were right, so we would prefer to keep this as it is.*
Figure 4. What do the blue bars in Figure 4G indicate? The colour bar font in H and I is small and hard to read.	*We now specify what are blue bars. We also increased the font size in panels H and I.*