

Interactive comment on “Forecasting wind-driven wildfires using an inverse modelling approach” by O. Rios et al.

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We thank the Anonymous Referee #1 for these comments.

We had explicitly addressed already the definition of the term ‘invariant’ and the meaning of its spatial and temporal variations. This is in the manuscript, starting in line 11 of page 6926:

“Invariants are the set of governing parameters that are mutually independent and constant for a significant amount of time. Therefore, our implementation relies on the assumption that some physical attributes of the system remain constant at least during some time. Those attributes can be uniform, a scalar or a vector field with spatial dependency. Examples of such quantity are initial fuel’s moisture content or fuel depth”

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This explanation is improved in the revised version by adding that from the point of view of our methodology, invariants are a central concept to forecasting systems that do not focus on the initial conditions only. For example, weather forecasting solves an inverse problem to find the initial conditions, and then run the forward model for predictions. In our work, we solve the inverse model of selected key parameters inside the governing equations, the invariants, not the initial conditions. It is an essential property of the invariants that they remain constant during the lead time of the forecast. When any invariant changes significantly (eg, due to divergence of the assumptions or external conditions) its effect is to limit the lead time.

The two typos noted have been corrected in the revised version.

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