Integrability conditions for nonrotating solutions in $f(R)$ gravity

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Reply to the Reviewers' Comments

Dear Review Team:

We thank the content reviewers and the entire review team for the kind reading and constructive comments.

- Regarding the Reviewer's observation that Paper I on "Existence of anti-Newtonian solutions in fourth-order gravity" and Paper II on "Integrability conditions for nonrotating solutions in f(R) gravity" share similarities, it is true that both contributions fall within the general framework of irrotational spacetimes. However, whereas Paper II by Elmardi and Abebe studies the general integrability conditions of such spacetimes, Paper I by Abebe studies specific properties of one out of the many irrotational spacetimes, the anti-Newtonian models. These (anti-Newtonian) models are the most unique type of spacetimes that warranted a detailed, stand-alone investigation.
- We have carefully revised the manuscript based on the Reviewer's comments: all inconsistent abbreviations ("Eq" and "Eqn") have now been addressed (changed to "Eq." throughout, the referencing is now consistent with the prescribed format, and
  1. The term "universe" is no longer capitalized.
  2. The terms "heat flux" and "anisotropic pressure" are now mentioned in the right order.
  3. The overdot is now properly defined the first time it appears, equation (4).
  4. The term "linear order" above equation (4) has been expanded to "to linear-order perturbations around an FLRW background".
  5. The font styles of divergence and curl are now consistent.
  6. The "nabla tilde" symbol has now been defined the first time it appears, below equation (7).
  7. The suggested grammar corrections are made.
  8. Brackets have been added to the "curl(curl)" expression in equation (34).
  9. The typos above equation 35 and 36 have been corrected.
  10. "(in)consistencies" has now round brackets.

Thanking you in advance for your kind consideration.

The authors.