Reply to Referees on our manuscript ID: universe-3644984

Title: TIDAL FORCES AROUND BLACK-BOUNCE-REISSNER–NORDSTROM BLACK HOLE

We are thankful to the anonymous referees for their constructive comments and suggestions which helped us to improve the presentation of this paper substantially. We hereby provide the following detailed explanation of the questions raised by the referee and have also modified our manuscript (see the bold faced text) accordingly.

Reply to Referee 3 :

1. After Eq. 4, the sentence "where r_+ shows the distance.." should be rewritten to correctly describe the nature of the r_+ surface.
   Our Reply: We have rewritten the statement and included the complete description of possibilities of horizon for this spacetime geometry in the beginning of section 2.1.

2. After Eq. 6,. Given the signature of the metric Eq. 1 the values of e should be 0 and -1 (after the choice of normalization). Furthermore, Eq. 6 already describes the motion of neutral particles, due to the absence of the Lorentz force, thus the sentence right before of Eq. 7 should be rephrased.
   Our Reply: After Eq. 6, the values of e is corrected now. Since eqs.(7-10) represent the specific form of eq.(5) eq.(11) represent the specific form of eq.(6) for this particular spacetime metric. We have rephrased the sentence just before eq.(7) in the manuscript.

3. Although the author describes the radial and angular parts of the deviation equations, the author should provide more information regarding the t component of η, is not clear why "... gives no physically important information as such.." as stated in the manuscript.
   Our Reply: As Jacobi field equation corresponding to t coordinate comes out as $\ddot{\eta}^{\hat{t}} = 0$, which means its showing no variation w.r.t. affine parameter τ showing that tidal force corresponding to time coordinate is zero. Since the aim to study the geodesic deviation is to find out the relative acceleration between neighbouring geodesics, if any. $\ddot{\eta}^{\hat{t}} = 0$ doesn't give any important information in this respect.
   We have included a short explanation after eq.(24) in the manuscript.

4. In line 155, of page 6, it is said that the coordinate r is a parameter giving the same nature as the rest parameters, i.e. a and Q. The same occurs in the description of figure 2.
   Our Reply: In line 155, of page 6, its written **Following one can observe the variation of tidal forces with radial parameter r for different settings of all other BH parameters.**
   We have rephrased it as,
   As coordinate r depicts the distance from center, one can treat it as radial parameter and observe the variation of radial and angular tidal forces with r while fixing other parameters M, Q and a to different possible values.

5. I would strongly suggest that the author include more references that reflect the state of the art of similar problems studied in the past.

Our Reply: We have added the following references at appropriate places.

With best regards,
Sincerely,
Author (Rashmi Uniyal)