Ghosh and Mitra Reply: The Comment [1] criticizes its own Eq. (1). This equation was neither written nor used in [2].

The technical observation made in [1] is that configurations with $\alpha^2 \sim (r - r_+)^{-1}$ near the horizon ($r \sim r_+$) and with extremal topology, i.e., $\frac{b'}{\alpha} = 0$ at the horizon, have *curvatures* diverging at the horizon like $(r - r_+)^{-1}$, because R has a term proportional to $(ab)^{-1}(r^2 b'/\alpha)'$ [3]. However, it is trivial to see that the integral of a curvature behaving in that manner is well defined near the horizon, where $\sqrt{g} \propto ab \to 0$. This is consistent with the equation for the extremal action given in [2] on the basis of the calculation indicated in [4].

Furthermore, it is to be emphasized that these configurations were not explicitly used by us, nor do they need to be used implicitly, as explained below, and are completely irrelevant for the conclusion drawn by us. The final, physical configuration in our approach [2] comes from the nonextremal sector and has finite curvature as well as finite action and leads to finite thermodynamic quantities.

The main misunderstanding of [1] is expressed in Eq. (1), which is not a correct representation of what we said in [2]. The issue is the determination of the configuration(s) of minimum action from the set of configurations of nonextremal topology and of external topology. We first argued that the configuration with minimum action must be one of nonextremal topology. To prove this, it is sufficient to show that for each extremal configuration with parameters m_1, q_1, there exists a nonextremal configuration with parameters m_2, q_2, such that

$$I_n(m_2, q_2) < I_e(m_1, q_1)\,.$$

In view of the discontinuity in the forms of the action between the two topologies, it is clear that this inequality is satisfied for $m_2 = m_1$, $q_2 = q_1$. But, it is also true that there exist small, but nonzero values of ϵ such that the above inequality of actions is satisfied with $m_2 = m_1, q_2 = q_1 - \epsilon$. *This point is overlooked in [1].* Since for each set of q_1, m_1, *whether equal or not*, there exist nonextremal configurations with lower action, the minimum cannot occur within the full set of configurations with extremal topology. Once it is established that only nonextremal configurations need to be considered in the search for the configuration with minimum action, simple calculations lead to the area formula.

A further criticism of [2] is made in [1], apparently in the belief that our work was based on the *assumption* of zero entropy. Again, this assumption was not used there. The expression for the extremal action can be explicitly calculated along the lines of [3] with appropriate boundary conditions as indicated in [4]. Thus, each of the objections raised in [1] is unfounded.

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