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Interactive comment on "Early–mid Miocene erosion rates measured in pre-Dead Sea rift Hazeva River using cosmogenic ^{21}Ne in fluvial chert pebbles" *by* Michal Ben-Israel et al.

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We thank Dr. Schildgen for the insightful and thought-provoking comments. We will incorporate many of the suggested changes and modify the manuscript to address the concerns raised. Mainly, the concerns raised are regarding the calculation and interpretation of the reported erosion rates.

The first comment is regarding the paleo-elevation of the Arabian Peninsula during the early-mid Miocene and the consequential production rate of cosmogenic nuclides during the deposition of the Hazeva formation. While we somewhat address this issue in the manuscript, we agree that the references cited do not provide clear evidence to con-

strain the timing of uplifting of the western half of the Arabian Peninsula and can only determine that it was uplifted to its current elevation over the last 30 Myr (see Feinstein et al., 2013; Willson et al., 2014). We will now include an additional calculation based on a moderate 0.5% gradient westward from a base level at the Mediterranean margin and over a ~200 km distance to the location of the currently exposed source rock. This simple calculation supports an elevation of ~1 km above sea level. Additionally, based on a comment made by the third reviewer (Marissa Tremblay), we now consider a range of possible elevations between 500-1000 m and the ensuing production and erosion rates. We will alter the discussion, conclusions, and abstract accordingly in the revised manuscript.

The second concern is about the concluded differences between the Miocene and modern erosion rates. While it is true that both rates are relatively slow, it is important to remember that we are not comparing apples to apples – the modern rates are calculated for slowly eroding exposed surfaces, all that these samples have undergone is exposure and weathering from the source rock. In contrast, the Miocene samples were eroded, transported in the fluvial system, and deposited all the while exposed/partially exposed to cosmic rays. Therefore, we consider the calculated paleo-erosion rates to be a minimum calculation. Nevertheless, while we consider the difference between modern and paleo-erosion rates to be meaningful, we agree that the Miocene erosion rates are not comparable to rates measured in rapidly eroding locations, and we will address this in the revised discussion and conclusions.

The last comment made regarding erosion rates has to do with the small number of samples collected from currently eroding surfaces, i.e., in the Central Jordanian Plateau. Unfortunately, this area is very difficult to access currently, and therefore, we can only use the few samples collected there previously. However, we will now include in the manuscript data from several previous studies of modern erosion rates from locations across the Negev Desert, demonstrating the reported erosion rates are representative for this region (e.g., Boroda et al., 2014; Fruchter et al., 2011; Matmon et al., 2009; Matmon and Zilberman, 2016; Matmon et al., 2016). In addition to these concerns, two suggestions for the improvement of the manuscript were made, one to do with emphasizing the difference between the quartz sand and chert pebbles when it comes to inherited cosmogenic 21Ne in sediments. Thank you for this insight, we will now further discuss the different types of detrital material and how to interpret the measured cosmogenic 21Ne in them for calculating rates of surface processes. Finally, there are several line-specific comments, edits, and questions. We will address each one in the revised manuscript.

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