Topic editor decision: Publish subject to minor revisions (review by editor)
by Attila Demény
Public justification (visible to the public if the article is accepted and published):
The paper shows a database of garnet compositions, which can not only be used in geological research, but also in archaeological provenance studies.

Additional private note (visible to authors and reviewers only):
Please read the opinion of the reviewer (pasted below) and insert some explanatory sentences in the text as suggested (see the last sentences). Then the paper will be accepted.
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The manuscript focuses on the creation and use of a freely accessible dataset of published analyses of 95,650 different genetic types of garnets from different rocks around the world. Of particular interest are the data published before 1990, which are only available in printed journals. These data usually contain garnets with unusual compositions, endmembers, or garnets with high concentrations of one or more elements. In most cases the localities where the garnet comes from are no more available. The proposed data files can help users for preliminary categorizations and correlation of newly described garnet with those already described in the literature. However, when studying and correlating common garnets in igneous and metamorphic rocks, it is necessary to clarify first what we expect from their comparison. In metamorphic rocks, garnet forms by gradual fractionation of the host rock composition during temperature and pressure increase that results in compositional zoning from the cores to the rims of garnet. This means that analyses with different compositions can come from a single grain, not to mention garnets grains from different compositional layers within the same sample. This also applies to trace elements, some of which have a high partition coefficient in garnet and results in concentration in the cores compared to the rims.
Although garnet is one of the best refractory phases, which can preserve compositional growth zoning under low to medium temperature conditions, by high temperatures imprint its zonation can be modified and homogenized. If the rock was subject to a new metamorphic process, the garnet can undergo decomposition, dissolution, and regrowth. Therefore, it is important to know from which part of the garnet or from which generation the selected analysis comes from. There are number of plutonic rocks that crystallized in the lower-medium crustal levels, where garnet formed during cooling as a result from reactions among the already crystallized minerals and residual melt. In contrast to volcanic rocks, such garnet must not belong to stable phase during overall magma crystallization and cannot be compared with garnet crystallized under equilibrium conditions with other phases.
In summary, it can be said that the proposed data set of garnet analyses is important, especially for garnets with specific (unusual) composition and genetic types, but mainly,

that the set includes garnet analyses from older literature. However, for overall description and explanation in the manuscript, it is necessary to outline the limitations of the data set, especially the fact that the different composition may come from individual garnet grains due to its growth zonation. Further complexity can occur when the zoning profile is modified or garnet underwent partial decomposition, dissolution, and accretion of a new garnet during subsequent metamorphic processes. Such examples are reported throughout the literature and were most recently summarized in (Journal of Petrology, 2023).

Author Response: Thank you so much for the second review of this paper. We greatly appreciate the time and care provided in these comments and added a section (3.5 Dataset Applications and Limitations) to address these concerns. We also added a citation to the work by Wang et al., 2023 in Journal of Petrology and we hope this is the correct paper as indicated by the reviewer.