

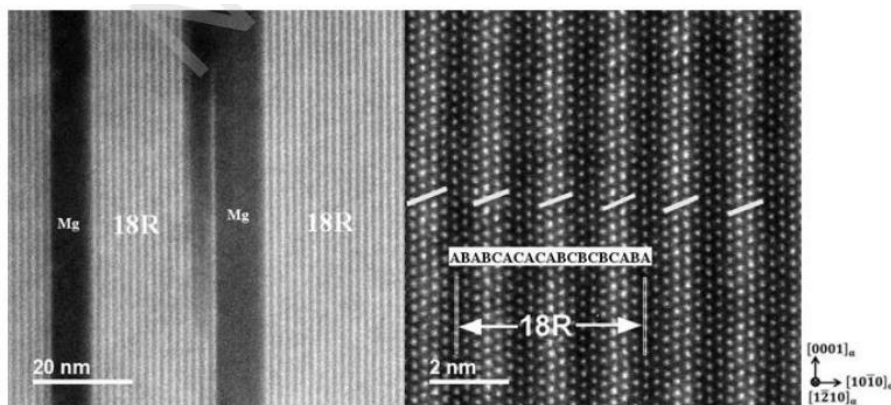
# Response to Reviewer 3 Comments

**Point 1: Abstract:** there should not be abbreviation, HTS, LPSO.

**Response 1:** The abbreviation in the abstract has been changed to the full name.

**Point 2: Introduction:** please make sure, that you give background on the chemical composition of the LPSO phases according to the alloy used:  $\text{Mg}_{12}\text{Zn}(\text{Gd},\text{Y})$ , same counts for the W-phase.

**Response 2:** The reviewer's questions are very meaningful. It is not easy to find out the exact molecular formula of LPSO phase and W-phase compared with the alloy composition in this paper, nor the details that can be achieved in this paper. Therefore, the molecular formula of these two compounds in this paper is only in accordance with most of the current literature (newly added Ref. 13 in the paper), which does not affect the conclusions of this paper. By the way, the author has previously used HAADF-STEM to study the atomic structure of the LPSO phase in  $\text{Mg-4.5Zn-6Y-0.5Zr}$  alloy. In the dark field image of the high angle ring (see the figure below), the dark small dots are magnesium atoms, and the bright ones are the segregation of Y and Zn atoms on the stacking fault plane. However, no more detailed distinction has been made.



HAADF-STEM image of LPSO phase in  $\text{Mg-4.5Zn-6Y-0.5Zr}$  alloy.

**Point 3: Results:** how many repeated measurements are done to evaluate the hot tearing parameters? For sure more than one time – please add error bars / standard deviation to parameters in Table 3.

**Response 3:** Thank you very much for the reviewer's reminder. Each group of hot tearing parameters was obtained from at least three experiments. The test data can only be used in the article if the same experiment results appear three times. The corresponding description and standard deviation have been added to the article.

**Point 4:** Figure 12: description of phases colored blue, red and green (Figure 12b top right) is very difficult to see.

**Response 4:** The figure has been modified.

**Point 5:** Figure 14b: labeling and scale too small.

**Response 5:** The figure has been modified.