

## Authors' Response

We thank the reviewer for the feedback. Our point-by-point responses are below:

[line 83] “those from” can be deleted. [line 90] Replace “occurred recent relative the timing of” with “post-dated”.

### **Revised as suggested.**

[line 180] “(but not the same as the original unbroken crystal)” can probably be deleted. I think this is a reminder of the conceptual difference between their correction and the original one proposed by Farley, but it’s not really necessary and potentially confusing in this context.

### **Revised as suggested.**

[line 207; Equation 6] The  $4/\sqrt{3}$  should be surrounded by parentheses, and the “s” should be put back on the end of “ends”. At the same time, the authors might want to consider an alternative way of presenting the equations. It might be a little less confusing to use only one equation and introduce a variable  $L_f$  (or something like that) for fragmentation-corrected length, which is  $2L$  for crystals broken on one end and approaches infinity (but is approximated as  $20L$ ) for crystals broken on both ends. That way the reader does not have to remember that the extra factor of 2 is a stealth addition to both the numerator and denominator of Eq. 5, and also makes it easier to apply to different beta equations for other crystal morphologies, by just replacing  $L$  with  $L_f$ .

### **Revised equation as suggested. We opted not to change the specific beta equations because the modification of length variable ( $2L$ v. $20L$ ) is clearly discussed in the text.**

[line 218] The phrase in parentheses does not add anything, and distractingly implies that zircon fragments are not common, which will certainly vary from place to place. A better addition might be a reminder that a different beta equation would apply for zircon.

### **Revised as suggested to include qualification about different beta equations, and to emphasize that zircon fragments are not necessarily uncommon, but simply less common than apatite fragments.**

[line 236] Replace “when these assumptions are relaxed. In other words, (B)” with “which”

### **Revised as suggested**

[line 273 and 385] It might be better to say “violated” rather than “relaxed”, because the assumption is not really changed, only whether the synthetic data obey the assumption.

### **Revised “relaxed” to “not met”**

[line 352] Delete “a” before “fragment”

### **Revised as suggested.**

**Additionally, we have added an updated acknowledgments section to reflect the contributions of the referees and others to the manuscript.**