***[NOTES to Jessica are indicated thus, and will be omitted from the letter to the editor. Red is just where I edited this letter. When these changes are accepted/ rest of the red is gone, this letter should be ready to send!]***

**Response to referee, manuscript number ApJ100542**

Dear Editor,

We would like to thank the referee for the positive and very constructive report. Included below is a detailed response to the referee's report of the paper entitled, "*Contraction Signatures Toward Dense Cores in the Perseus Molecular Cloud.*” The changes are marked in **bold face** in the revised manuscript and are described following each referee comment *reproduced in italics.*

*Comment 1) It would be good if the authors could say a bit more about how the cores were originally identified. The authors say at what cut-off density the cores are truncated in terms of H2 density, but not what method or tracer was used to derive the density in the first place. What algorithm was used to identify the cores e.g. clump find, gauss clump, straight density threshold?*  
Response 1: A few sentences were added to the beginning of Section 2 to specify that the cores were chosen from Bolocam and SCUBA maps via other molecular line surveys, and that the effective H2 column density cutoff originates from the selection of cores with the brightest Bolocam continuum flux density.

***[I don’t think the referee is questioning the cutoff, so omit in reply. Also, this assumes ALL sources, whether D, S, B had a Bolocam flux density… I’d skip the details.]***

REPLACE ENTIRE RESPONSE WITH THIS (no need to give all details)

Several sentences were added to the beginning of Section 2 to specify how the cores were first identified in dust maps.

*Comment 2) I am confused about what optically thin tracers were used to actually characterise the cores in Table 2. Three tracers are stated for columns 2 & 3. The authors measured N2D+ but they also say they use N2H+ to reject some cores. Are different tracers used to measure the velocities in different cores? Preferably the authors should use the same tracer for all cores. If this is not possible, they should show that the optically thin systemic velocity and line width don't vary with the tracer used to measure them.*

Response 2: There is a footnote “a” in Table 2 that indicates which optically-thin tracer was used for each core, but we hope that the following changes have made this, as well as the general layout of the paper, clearer:

Section 3 has a new paragraph that discusses the use of N2H+ or NH3 where the cores were not detected in N2D+. As suggested by the referee, we have provided evidence that indicates that the systemic velocity and line width do not vary much across the three tracers. A reminder of the use of N2H+ or NH3 was added to Section 4.1 when discussing the HCO+ line asymmetry measurements.

***[I removed the % change in line position: because the zero point of the velocity axis is arbitrary, this is irrelevant.]***

Section 3 was also renamed from "Results" to "Line Profile Fitting and Detection Rates" and now includes text discussing line profile fitting, moved from Section 2. We also renamed Section 4 from "Analysis" to "Core Contraction Analysis" because discussion of spectral line profile fitting was consolidated in Section 3.

In Section 4.1, we define targets with no evidence of secondary cores along the line of sight to be "single cores" to make the ensuing statistics and discussion clearer.

*Comment 3) In the right panel of Figure 4, how is it possible for there to be point in the lower left quadrant? All the properties are derived from the HILL model since delta v now uses the derived systemic velocity.*

Response 3: This is a very interesting point. The parameter V\_thick used in Equation (1) to define delta\_V (and here delta\_V^\*) is not a property derived from the HILL model. Uncertainty in its measurement could be the cause of the two outliers present in the right panels of Figure 4. We added a few sentences to Section 5.1 to discuss how the outliers located in the lower-left (and upper-right) of the figure could be due to the fact that the measured V\_thick does not accurately measure the velocity of the line profile peak.  
  
*Comment 4) I am very confused by Figure 5 and its discussion. The authors talk of using the optically thin transition of HCO+, but if this is optically thin there can be no blue asymmetry. How can infall be detected in such a system if this asymmetry is not present? How many of the cores are optically thin in HCO+ and what does this mean for the number of cores where infall would be detectable.*

Response 4: We apologize for the confusion. We have now included in the introduction to Section 4.1 a short description of the ambiguity/impossibility of using optically-thin tracers to infer kinematics. Sources with optically thin HCO+ are excluded from the core contraction analysis. We also added a preface to the discussion of Figure 5 (right) and 6 (blue) in the last paragraph in Section 5.1 to emphasize that we are using optically-thin HCO+ instead to search for possible systematics between velocities from HCO+ and our Nitrogen-based tracers when both tracers are optically-thin.

***[I omitted the statement about media value being “not insignificant” – they are insignifcant. I also shortened the text introducing Figure 6 and the omitted the duplicated material in the caption (authors are encouraged not to have long captions including anlaysis).]***

*Comment 5) Many of the cores cannot be treated as a single object, particularly for the protostellar sources because of their multiple line profiles. This means that this analysis cannot be applied to the bulk of the sources and that the HILL model of an isolated spherical core collapsing is not the best model for their dataset as a whole. I understand that it is hard to get estimates of infall velocities without making such simplifying assumptions. Nonetheless the authors should discuss this caveat in the paper. The idea of the second velocity coming from a gas around the core is particularly interesting and may be in good agreement with theoretical models of turbulence and cores in filaments.*

***[I think the referee is also speaking of the possibility of environmental dense gas in filaments and confusion in clustered environments (not isolated) and so I generalized this a bit, emphasizing the caveat too.***

***There is no need to spell out all details in the response below – the referee can read the new paragraph.]***

Response 5: This is a very important point and is discussed as a caveat in a new paragraph in Section 4.2.

*Comment 6) It has been shown in Chira et al. 2015 that red asymmetries can be found even in collapsing cores and that the number of collapsing cores showing the blue asymmetry should always be less that 100% in a clustered environment. The authors should maybe add this to their discussion.*

Response 6: A paragraph on the results of Chira et al. (2015) was added to Section 5.3. We discuss the possibility of obscuration of evidence of blue asymmetries by the confusing emission of the surrounding gas.

***[In the tex file I am distinguishing between obscuration of evidence and confusion of the details in the profile (the profile itself is not obscured).]***