GENERAL OVERVIEW: Lewis et al. work titled "Recent Precipitation Decrease Across the Western Greenland Ice Sheet Percolation Zone" reconstructs annual accumulation rates by using a well-known method of combining snow/firn density profiles from ice cores with the depth at which radar isochrones are found; in the dry-snow zone, radar isochrones are related to the depth-hoar formed at the end of summer, effectively marking annual accumulation layers. Here, they use the methodology in the percolation zone, and compare results with those of regional climate models to conclude that precipitation rates in the percolation zone of western Greenland show a decreasing trend. The data presented is of interest, and the radar data obtained over the percolation zone is certainly of importance. The paper is well written and clear, and I have few corrections regarding that. The methodology is well described, but I do however have some comments regarding the validity of the it given the interpretation of results. The paper could also do a better job summarizing recent studies in the area; this needs to be addressed to avoid any impression that authors are cherrypicking results to reinforce their conclusions. Only Overly et al. findings are quoted using a similar method, but there are several studies showing that accumulation rates are increasing in this area (e.g. Koenig et al.).
Thank you for your review and comments, we believe they have made the manuscript stronger and more succinct. Our introduction covers all recent *in situ* radar studies in this region and we are the first to collect data throughout many regions in the traverse. We highlight several studies that use similar methods (e.g. Hawley et al., 2014) and studies using other methods that found different results (e.g. Wong et al., 2015; Overly et al., 2016).
Our results are statistically indistinguishable from those of Koenig et al. (2016; not shown) over 2009-2012. Our accumulation trends from 1996-2016 cover a longer duration than the data from that study and their accumulation trends are almost all statistically insignificant. Koenig et al. (2016) discusses increased accumulation near Camp Century only within the MAR RCM, which "differ in magnitude from the radar-derived measurements in 2010 or 2011."
The following text has been added to section 3.2 "Similarly, our 2011-2016 accumulation is statistically indistinguishable from average 2009 – 2012 IceBridge snow radar measurements analyzed by Koenig et al. (2016), with an RMS difference of 0.0489 ± 0.0961 m w.e. a^{-1} along a total of 69.7 km of overlap (not shown). Koenig et al. (2016) use a different radar system on an airborne platform and are able to calculate annual accumulation at elevations below 2000 m a.s.l., however the GreenTrACS accumulation record covers a much longer temporal duration than the data from that study."

There is too much emphasis on the comparison with IceBridge radars, but clear differences between the VHF pulse radars and microwave phase-sensitive radars must be made because they operate differently.
The following text has been added to the introduction "Note that our *in situ* GPR operates using a UHF pulsed radar, while other systems such as frequency modulated continuous wave (FMCW) radars use phase-sensitive radar architecture that include both amplitude and phase information." While the pulse and phase-sensitive radars operate differently, the radargrams generated by pulse radars within the VHF-UHF spectrum allow us to trace isochronous IRHs and calculate accumulation, in a similar way to the airborne FMCW approach. In dry snow/firn, the relative dielectric permittivity is not sensitive to frequency in the range between UHF and microwave, and therefore the radar velocity is not influenced by the different frequencies of these systems.

Although the uncertainties in the shallow firn core data are well explained, there is not sufficient details on the radar uncertainties, which are definitely large enough. This can even be seen at the sites where the shallow firn cores were taken (e.g. Figure 5).
A detailed explanation of the radar uncertainty can be found in Section 2.6.
Figure 5 shows that radar and firn core accumulation measurements are statistically indistinguishable at four example core sites, which is also the case at all sixteen core locations. We believe that these uncertainties are small enough to allow for analysis of accumulation trends in our dataset.

In my opinion, the emphasis should not be so much decreasing accumulation, which the authors hypothesize is caused in part by blocking of storms in the summer; the models only show a very slight decrease when looking at decadal trends, and the differences with the radar-estimated rates are larger than that, even over the core sites (Figure 5).
Although the decrease in accumulation is small, we show throughout the manuscript that it is not negligible. Furthermore, the general narrative in the literature is that accumulation is increasing, and will continue to increase, with higher human-forced temperatures due to higher saturation vapor pressures. We show that this is not the case over the past two decades in our study region, and we point to the importance of summer blocking as a driver of the accumulation decline, which has not been discussed extensively in the literature. We emphasize the accumulation decline because none of the CMIP5 GCMs can accurately capture recent Greenland blocking activity (Hanna et al., 2018), and our results highlight that mass loss is currently occurring from both sides of the SMB equation (declining mass input, and accelerating mass output from melting and runoff). We therefore respectfully disagree that this should not be emphasized in the paper; we believe that it is the most important contribution that this paper makes to our understanding of Greenland SMB.

Section 2.2. How do you differentiate between annual accumulation layers (depth hoar formed in September/October) from percolation layers formed during the summer? As stated, unlike phase-sensitive radars, GSSI pulse radars can penetrate ice layers if they are thin enough, but without power analysis they look the same as depth hoar.
We do not differentiate between annual accumulation and percolation layers. Rather, we calculate accumulation between adjacent IRHs using the age and mass between these isochrones, determined from the depth-age scales and densities interpolated from the firn cores. The SMB is indifferent to where the mass originated, all we're trying to do is calculate that mass balance.

Ln 157 A radar isochrone is by definition continuous IRHs, so this is redundant. What you really mean is that the isochrones observed have been related to annual accumulation layers.
We have updated the text to reflect this distinction. The text now reads "The 400 MHz short-pulse radar has a range resolution (ability to resolve distinct features) of 0.35 ± 0.1 m in firn, which is fine enough to resolve Internal Reflecting Horizons (IRHs) that have been related to annual accumulation layers (Medley et al., 2013; Rodriguez-Morales et al., 2014; Spikes et al., 2004; Hawley et al., 2014)."

Ln 233 Why is the diameter needed? isn't the diameter of the cores approximately the same? If this is due to irregularities in the shape core, then it has to be explained that the core is assumed to have a cylinder-like shape with measured diameter.
The diameter of the core fluctuates slightly (<1 mm), so to accurately calculate the volume and density of each core section we measure the diameter of the core at the beginning, middle, and end of that section using calipers. Since the radius is squared in the cylinder's volume calculation, it is imperative to know the radius as accurately as possible for density calculations. For more information see Graeter et al. (2018).

Ln 253-254. This phrase is not clear; please explain better.
The text has been modified to "Final calculated accumulation rates are insensitive to the input accumulation parameter we use to calculate our Herron-Langway models (Lewis et al., 2017)."

Ln 256-260. It is really hard to believe this statement without more in-situ data. As a matter of fact, there are studies that show that 21st Century percolation facies not only consist of pipes and lenses, but widespread layers that do amount to a fraction of the total accumulation (Perry et al., 2007; Helm et al.,

2006; de la Pena et al., 2015; Machguth et al., 2016). At the very least, an assessment of the uncertainties related to this should be given.
These studies are all from lower elevations on the ice sheet, where certainly the reviewer is correct that ice lenses can be widespread and account for a significant fraction of the year's total accumulation. At the higher elevation of our firn cores, however, we did not observe widespread ice lenses across the snow pits used to extract cores, snow pits used for stratigraphic analysis, or snow pits used for camp. Cores 1 – 7 had an average of 1 – 5 cm total ice layer thickness per year, while cores 9 – 16 had less than 2 cm of melt per year, most of which occurred during the past decade.

Section 2.4. Is this different as what is shown in Figure 2? Section 2.2 states a constant dielectric to estimate depth. Please clarify.
We have removed the sentence in Section 2.2 that made it appear we were using a constant relative dielectric permittivity to estimate depth. In actuality, we calculate permittivity from the density (equation 2) in order to calculate the velocity (equation 1) so that we can determine depth from the TWT.

Section 2.5. It is stated that sometimes a "layer appears to bifurcate…" How does the authors know that the layer being traced is an actual annual layer (e.g. a depth hoar) and not a percolation feature?
We do not distinguish between annual layers and percolation features, rather, we trace IRHs from one firn core to another in order to calculate SMB between the two cores. It doesn't matter what contrast in relative dielectric permittivity is causing the IRH, all that matters is that these horizons are isochronous and we know the date of each layer within ±0.5 years. If the accumulation rate changes substantially and layers bifurcate multiple times, it would be possible that the traced IRH represents a different part of the year from the original traced layer. Since our epochs represent five years, at most, this could change the length of the epoch by ~10%, but we do not have any IRHs between adjacent firn cores that exhibit this behavior.

Ln 313-318. If the range resolution of the radar as stated in Section 2.2 is 0.35 m, then how it is possible that two radar samples are 0.12 m? This is inconsistent. My guess is that the uncertainty in accumulation estimates just from this would be at least the resolution times density, which is much higher than what is stated here.
The range resolution (ability to distinguish distinct features) is 0.35 m, and is controlled by the radar bandwidth, but the radar sample spacing, which is controlled by the sample frequency of the analog to digital converter, is 0.12 m. We cannot definitively distinguish which range bin the IRH lies within, hence our uncertainty of 0.35 m. The resulting uncertainty in accumulation is 0.0709 m w.e. a^{-1}, accounting for uncertainties in radar precision, tracing IRHs, errors in dating the firn cores, and errors in our density estimates.

Ln 325-326. But it was stated in Section 2.3. that variable percolation facies do not affect estimates. I know is further discussed in Section 3.5, but my opinion is that more emphasis should be made in the variable structure of firn over the percolation zone.
In this paragraph we are saying that the difference between calculating accumulation using measured density profiles and calculating accumulation using estimated/interpolated density profiles has larger errors for the southern cores because meltwater percolation and ice lenses complicate the density profile. We have added the following text to L316-317 "Throughout this study, we use our measured density profiles to calculate accumulation at core locations, rather than rely on Herron-Langway density models that would result in larger uncertainties."
Numerous studies have documented the heterogeneity of firn throughout the percolation zone and the complications of calculating SMB due to ice pipes and lenses. Here we attempt to accurately calculate accumulation using firn cores and *in situ* GPR throughout this complicated region. The text has been updated to reflect these complications.

Ln 673-674. Please provide references.
We have added references for these climate models. This sentence now reads "Overall, the Polar MM5 (Burgess et al., 2010), MAR (Fettweis et al., 2016), Box13 (Box et al., 2013), and RACMO2 (Noël et al., 2018) Regional Climate Models accurately capture large spatial patterns in accumulation over the GrIS, but show statistically significant differences from GPR accumulation on a regional basis."

Ln 677-678. I do not believe this statement is correct. Uncertainties in radar-derived rates are in my opinion much larger.
Please see section 2.6, and specifically equation 5, for formal error propagation and uncertainty calculations. We believe that we have done everything to accurately constrain the accuracy of this radar system and have been conservative in our uncertainty analysis. For comparison, Hawley et al. (2014) calculate an accumulation uncertainty of ~0.015 m w.e. a^{-1} using a similar geophysical system, Overly et al. (2016) calculate an accumulation uncertainty of 0.01 m w.e. a^{-1} using the ASIRAS airborne radar, and Medley et al. (2013) calculate an accumulation uncertainty of 0.055 m w.e. a^{-1} using the IceBridge snow radar. Our total accumulation rate uncertainty for each epoch of 0.07 m w.e. a^{-1} is the same order of magnitude, but larger, than those reported uncertainties.

Figure 1. Please include elevation contour lines, it would be helpful for the reader even if most of the traverse is along an elevation of 2100 masl.
We have added the 2000 m and 3000 m contour lines to Figure 1. We believe these give an idea of the elevation of our traverse without crowing the figure too much.

Figure 5. Please add error bars to the GPR-estimated accumulation.
Error bars in the GPR accumulation are indicated in red. We do not show error bars for the annual core accumulation to simplify the figure, however the error bars for the 5 year averaged core accumulation is indicated in black (GreenTrACS cores) and blue (PARCA cores).

Figure 5 and 12. Please use a larger font size.
We have increased the font size for both figures. These figures are now easier to understand.