I enjoyed reading this paper, which presents significant new experimental results relating to secondary ice processes, and is certainly worth publishing. I have a few minor questions and suggestions for making the paper a bit stronger (see below).

Active between -3 °C ≤ T ≤ -8 °C, rime–splintering occurs when supercooled water drop diameters are < 13 µm or > 24µm (Hallett and Mossop, 1974; Mossop and Hallett, 1974; Mossop, 1978)

Maybe I misremember the Mossop 1978 paper, but should the condition on droplet sizes here be "< 13 µm ***and*** > 24µm" rather than **or** ?

Section 2

Perhaps it could be useful just to elaborate a little bit on these formulae. Maybe showing a figure with graphs of Ns vs DE; Phi vs T; f(T) would help make the general behaviour clearer?

The typical freezing shape of the ice particle is shown in Fig. 1.

Is the shape of the ice particle likely to be a relevant factor here? How could you find out? What is it likely to be in the atmosphere?

the impact velocity (V_0) for all experiments was 5.2m s^{-1}

it's worth pointing out in the text that this is below terminal velocity for a 5mm drop (which would be closer to 9 m/s). However in the real atmosphere the ice particle would be moving as well, so the differential velocity may be more realistic than it might initially appear.

In fluid dynamics, the Weber number, $We = \rho D V_0^2/\sigma$, and Reynolds number, $Re = \rho D V_0/\mu$, are used to relate inertial forces to interfacial and viscous forces, respectively. Taking into account the temperature dependent values of surface tension and viscosity of the supercooled water between -4 °C ≤ T ≤ -12 °C, the We and Re number ranges obtained were 1747 ≤ We ≤ 1772 and 8781 ≤ Re ≤ 12240, respectively.

I think in both cases here, it would be good to clarify what We and Re refer to – or more specifically *where* these inertial, viscous, and interfacial forces are acting. Often in cloud physics we think about the inertial, viscous in the air surrounding the drop, while here (I think) you are considering them *within* the water

Is it obvious what the length scale and velocity scale in We and Re should be? You have chosen V_0 for the velocity scale, so that implies the water fluid parcels of interest are moving at this velocity. So are you considering the downward motion of the liquid water at the moment of impact on the ice particle? Or the lateral velocity of the liquid water as it spreads out? (are these velocity scales comparable?).

For the length scale, it's not obvious what to choose, when you have a liquid spreading over a solid surface. The depth of the water coating? D is probably not an unreasonable choice, but maybe you can make the argument a bit more explicit somehow. Again, it all comes down to what aspect of the flow of the water you are trying to characterise.

Section 3 – you used a high speed camera. What exposure time was used? It seems from the images like the splash itself (t=0) is quite blurred. Was this limited by the illumination?

For figs 2,3,4 I did wonder whether adding some slightly more detailed description of what's happening in the various frames would help the reader interpret what they are seeing. It took me a while to get a sense of what was happening. Or maybe some extra annotation on the figures themselves?

Discussion - You mention the influence of the glass slide, and I agree the presence of the slide itself is definitely worth discussing. Another factor I can think of here is that the ice particle is effectively in a fixed vertical position, while in the atmosphere the ice particle is in free fall, and when the drop hits it, then the ice particle can move in response to that – so some of the drop's momentum can be carried to the ice particle. Would that change the way the water flows over the ice particle, and freezes?

In figure 5 I think it's important to clarify what the error bars represent in the caption, and in the text. Is it the variation from one experiment to the next, in the "same" conditions? Or is it the uncertainty on the mean value?

Connected to this is Table A2 – the values of phi, sigma, and sigma_phi_bar are all quoted to the nearest 0.1, which seems a bit coarse. Might be worth 1 extra significant figure?

The number of experiments is fairly small, given the variability in phi that's shown. I'm guessing these are quite time consuming to conduct and analyse. Perhaps you can discuss that a bit? In general I would enjoy seeing an expansion of the future work in section 6 to talk about how the experiment could be improved and elaborated. Likewise saying "*no quantification of the freezing fraction of the secondary ice drops [from the jet of smaller droplets] can currently be made*" is fine, but it would be good to discuss what you would need to do to quantify it, or study it in more detail.