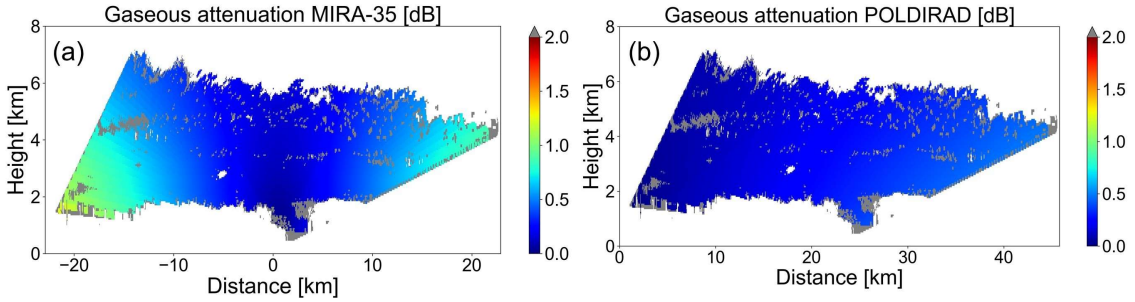

Figure S1: Gaseous attenuation estimation for Ka- and C-band for 30 January 2019 at 10:08 UTC using line-by-line formulas from ITU-R P.676-11 model (ITU-R P.676, 2016). Areas where masked and filtered measurement values locate are plotted with grey color.

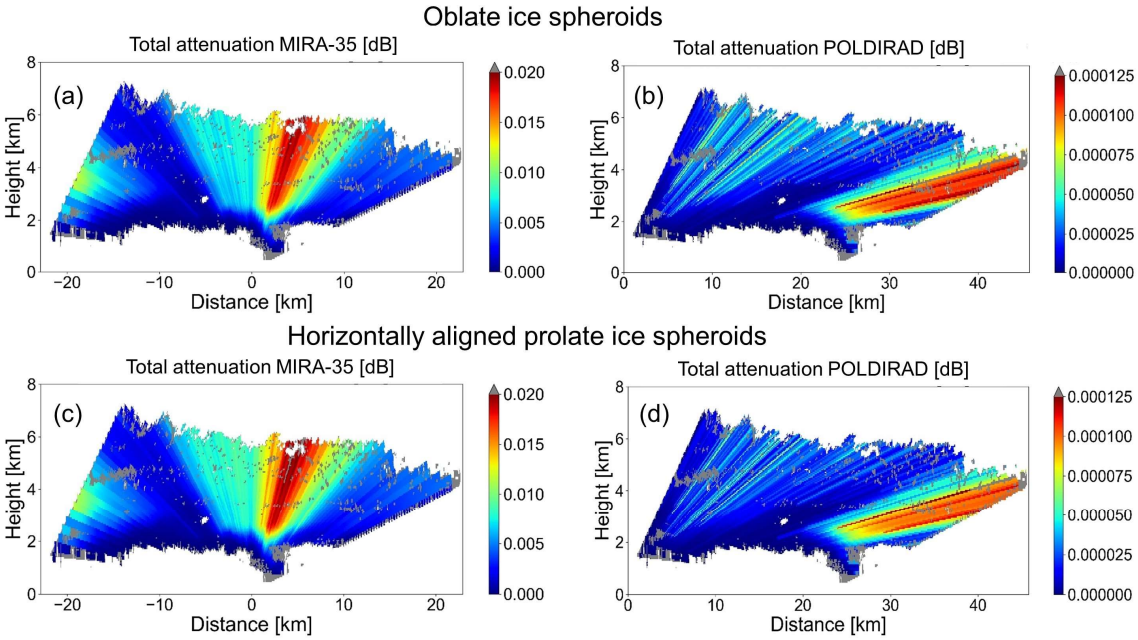

Figure S2: Total attenuation estimation for Ka- and C-band for 30 January 2019 at 10:08 UTC when (a, b) ice oblates and (c, d) horizontally aligned ice prolates and aggregates $m(D_{max})$ (Yang et al., 2000) are used for the scattering simulations performed by using PyTMatrix (Leinonen, 2014). Areas where masked and filtered measurement values locate are plotted with grey color.

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