Figure 11. Histogram of the NAT (solid lines) and ice (dashed lines) SADs for some CCMVal models and for CALIOP (2006-2010) are displayed. The histograms for the model data have been truncated and represent 93% of the total SAD. The straight lines at the top of the figure indicate the range of SAD values for NAT and ice "observed" by ground-based lidars and are taken from Adriani et al. (1995).

We observe that for most of the models NAT PSCs have SAD ranging between $3 \times 10^{-10}$ and $10^{-8}$ cm$^{-1}$ except for LMDZrepro that has larger SAD for NAT PSCs and is clearly an outlier. In general all models produce SADs for NAT that are smaller by one order of magnitude than the SAD calculated from CALIOP data, except for LMDZ-repro. The variability among models for the NAT SAD may be related to the assumptions made on the number of particles per cm$^3$.

The narrow peak at larger NAT SAD values for the LMDz model could be consistent with the use of much larger particle number density and smaller particle radius in the simulation. This in turn would give less irreversible denitrification processes simulated by the models with larger NAT SAD (CCMVal-2 report, 2010, Chapter 6).

Most of the models have ice PSCs in a SAD range between $2 \times 10^{-9}$ and $10^{-6}$ cm$^{-1}$ and are generally a factor of 2-3 smaller than CALIOP values, except for the W ACCM-CCMI simulations, which predict a larger value than that derived from CALIOP observations.