

ICE CRYSTAL NUMBER CONCENTRATION VERSUS TEMPERATURE

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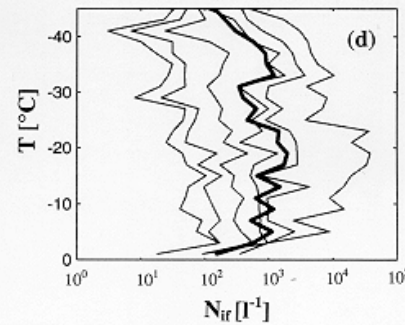
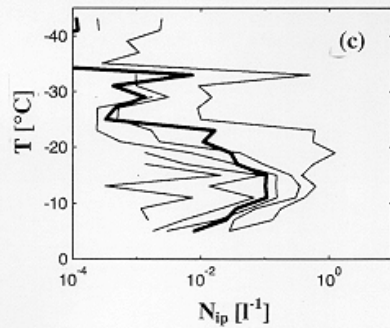
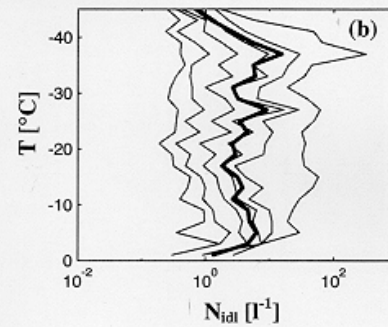
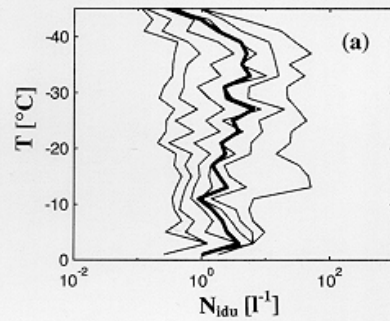
Objectives

- **Understand why is there a difference in previous parameterizations of Ni as a function of T????**
- **How good is the Reff-T relationships????**
- **Can we close the gap between the previous Ni-T relationships and new ones????**

2DC

2DC

FIRE.ACE-1998



2DP

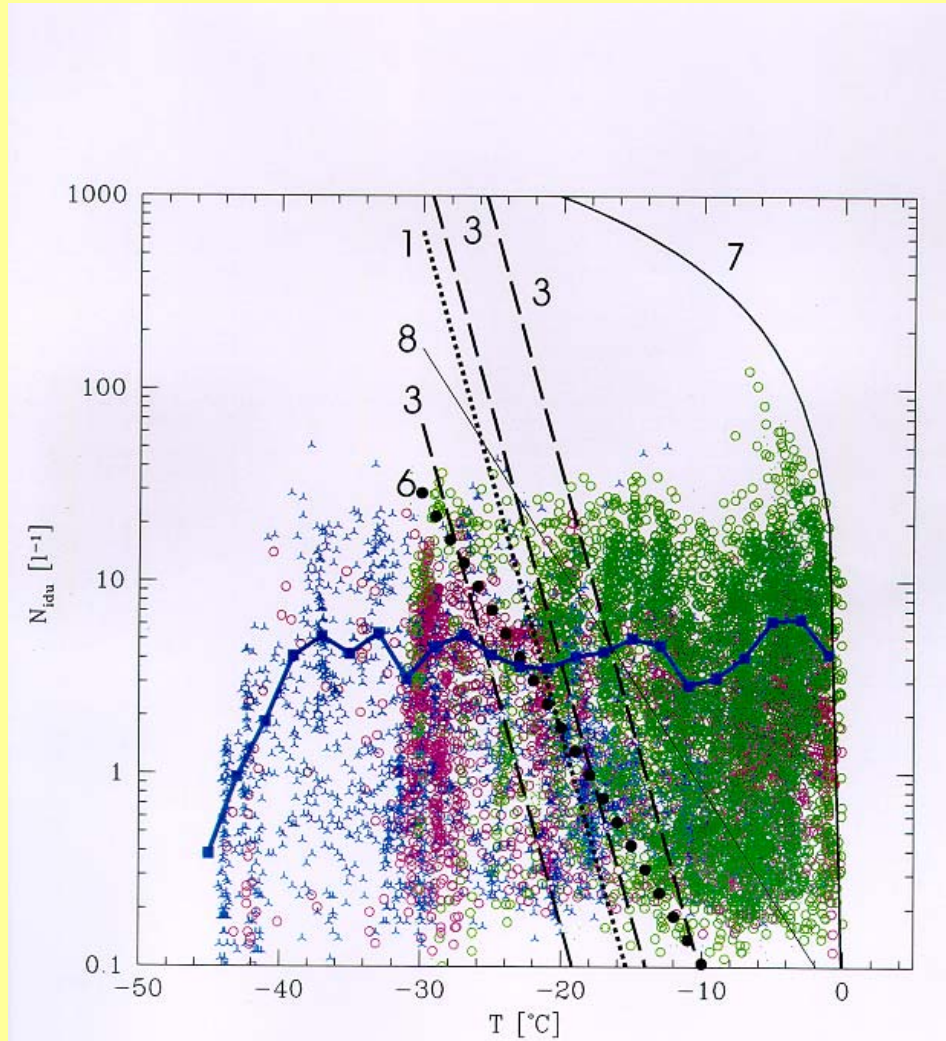
FSSP

[Gultepe et al., 2001, Inter. J. Climate]

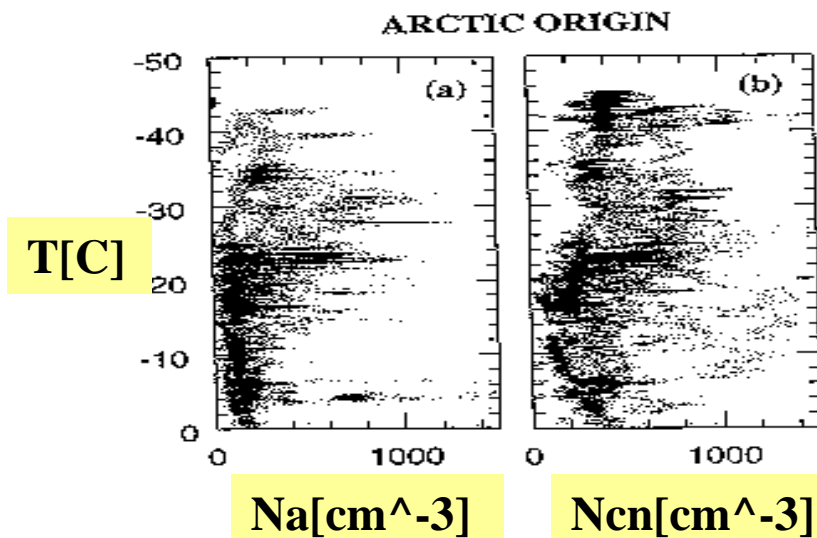
2D-C [25-800] μm
2D-P [200-6400] μm
FSSP-100 [2-47] μm

Ni-T

[Gultepe et al., 2001, Inter. J. Climate]



Na and Ncn versus T

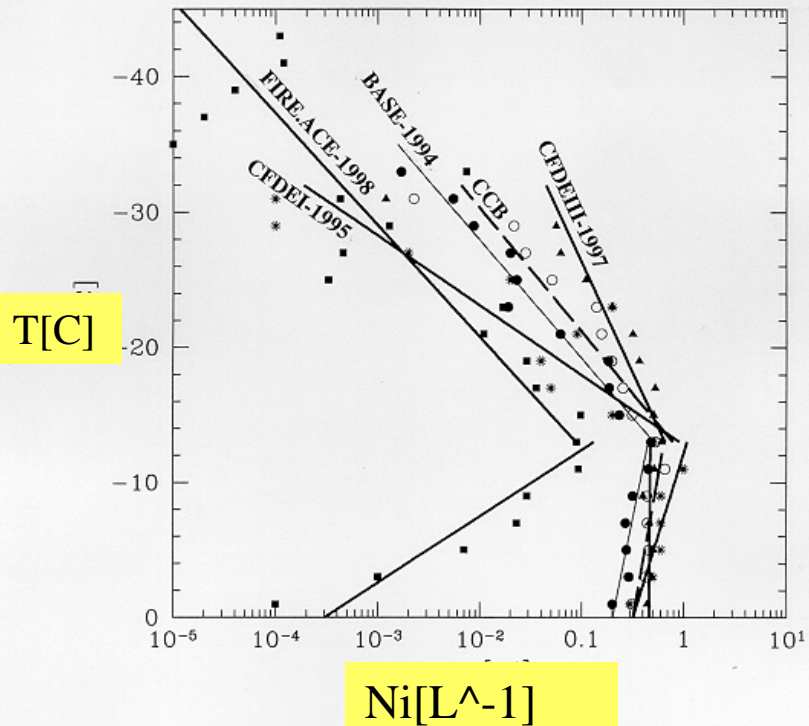


0.2-3 micrometer for Na (PCASP)

0.0003-3 micrometer for Ncn (TSI-3025)

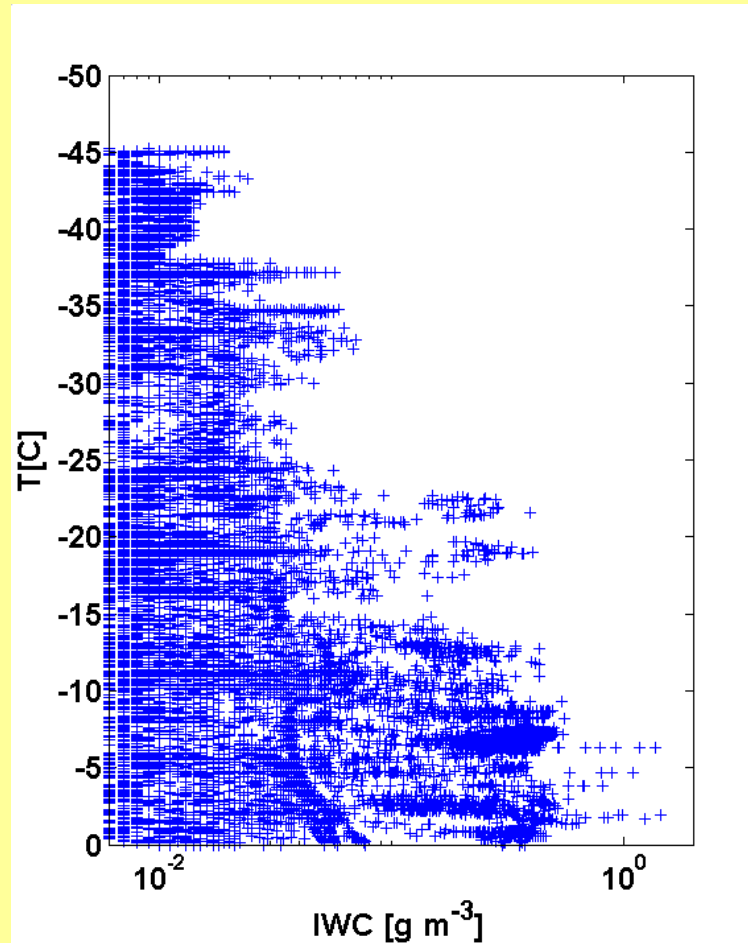
J. Geophys. Res. –Ocean,
Gultepe and Isaac, 2002

2DP Ni-T

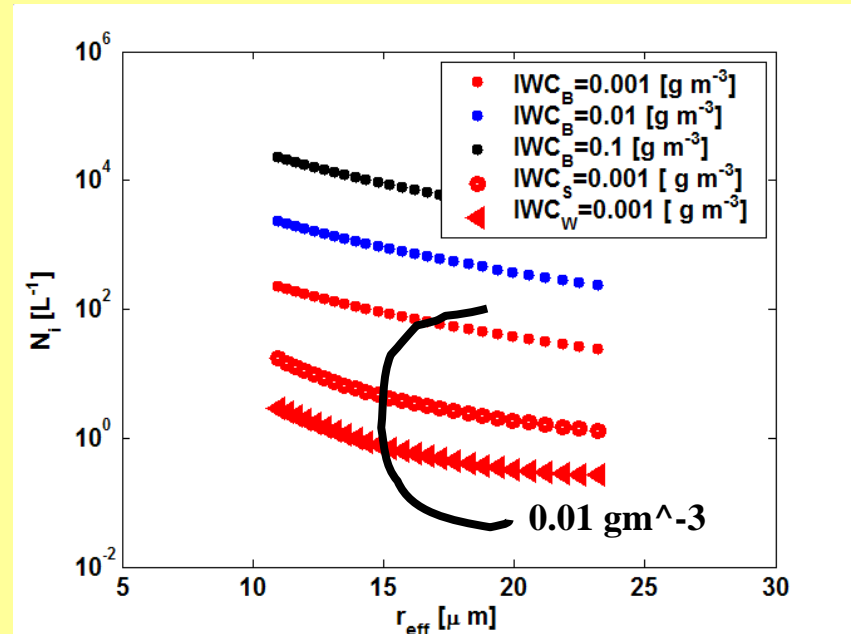
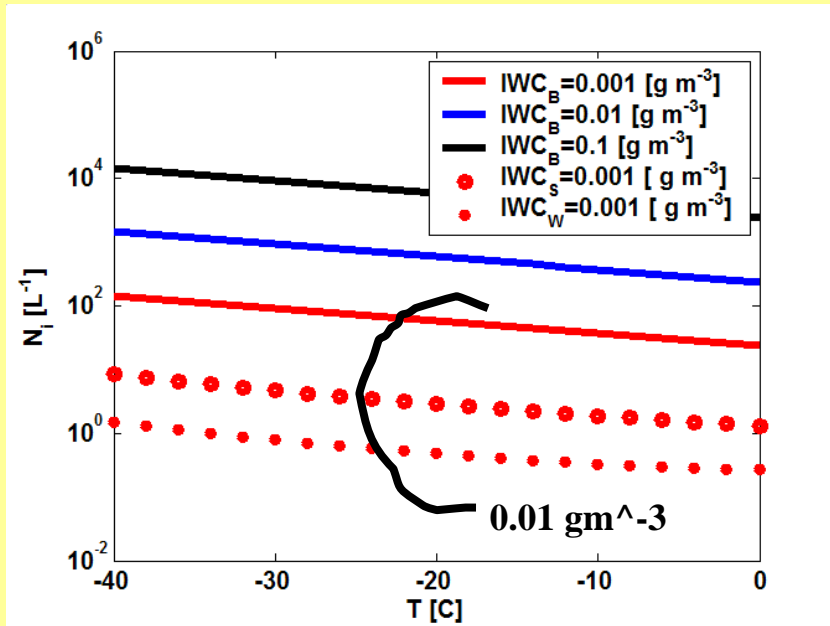


[Gultepe et al., 2001, Inter. J. Climate]

IWC-T (FIRE.ACE)



Ni-T and Ni-Reff

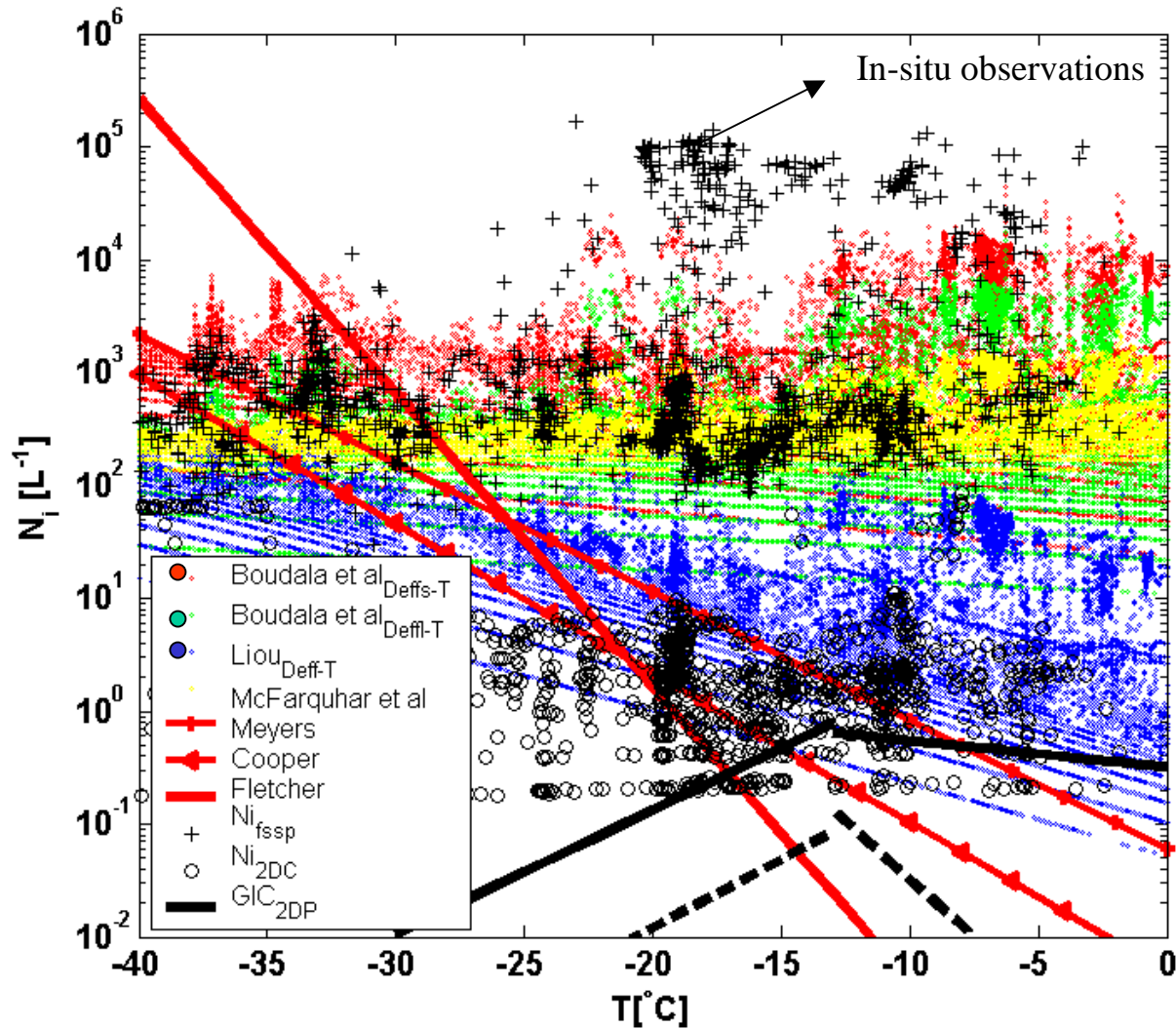


B: Boudala et al (2003)

S: Suzuki et al (1993)

W: Wyser (1998)

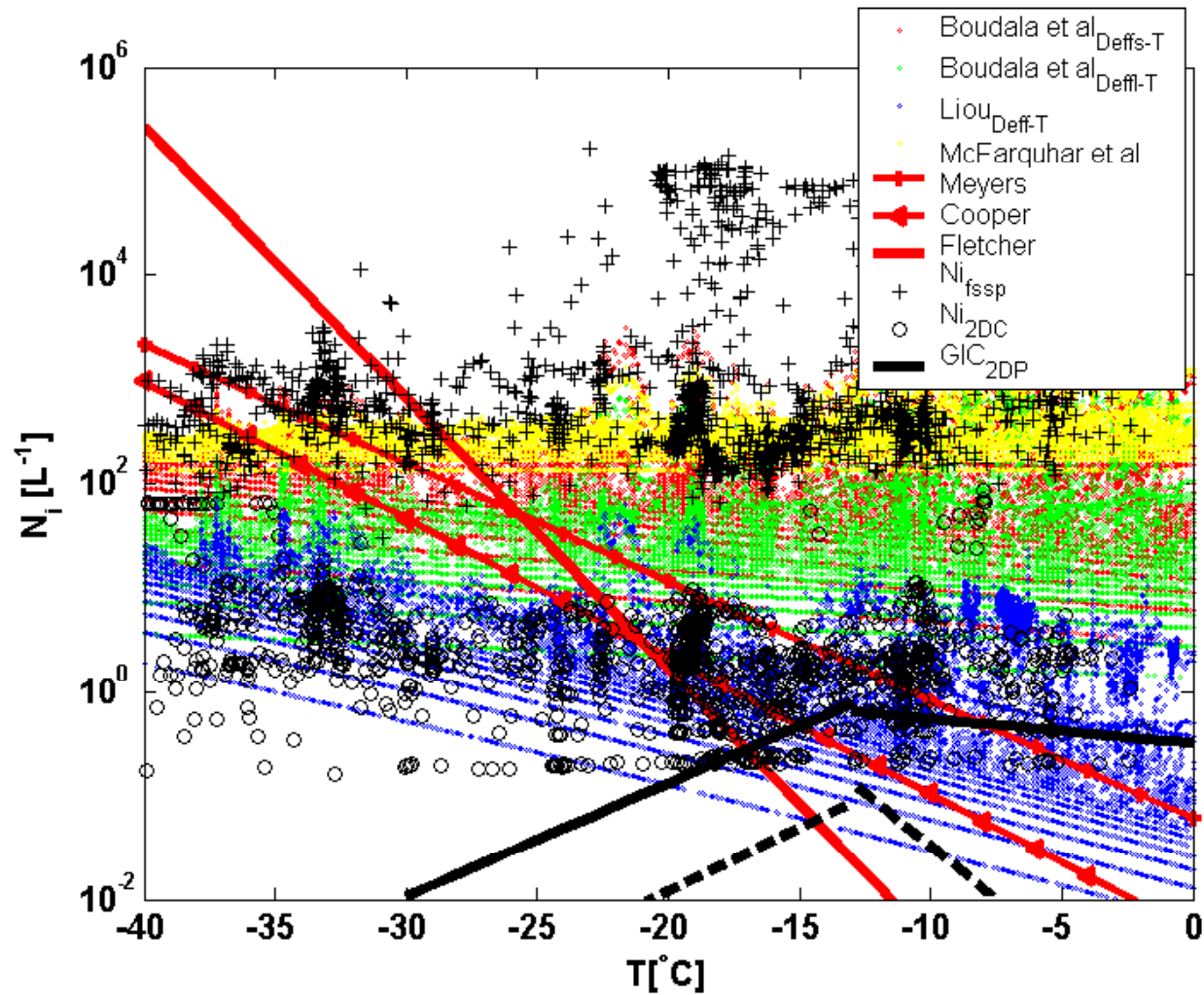
Ni based on Reff-T relationships and previous parameterizations



COMPARISONS

- Based on previous parameterizations:
- Ni is overestimated for $T < -25\text{C}$
- Ni is underestimated for $T > -25\text{C}$
- Based on Reff-T relationships:
- Ni is overestimated
- Ni distributions are found different

2*Reff



CONCLUSIONS

- **No significant relationship is found between Ni and T.**
- **Reff versus T relationships result in large differences in Ni; underestimation at $T > -25^{\circ}\text{C}$ and overestimation at $T < -25^{\circ}\text{C}$.**
- **Significant differences exist between Ni (IN)-T relationships.**

PARAMETERS/PROCESSES AFFECTING RESULTS

- **Small ice crystal number concentration???**
 - **Supersaturation environments ???**
- **Ice multiplication/aggregation processes???**
 - **Assumption of $N_i \sim N_{cn}$???**