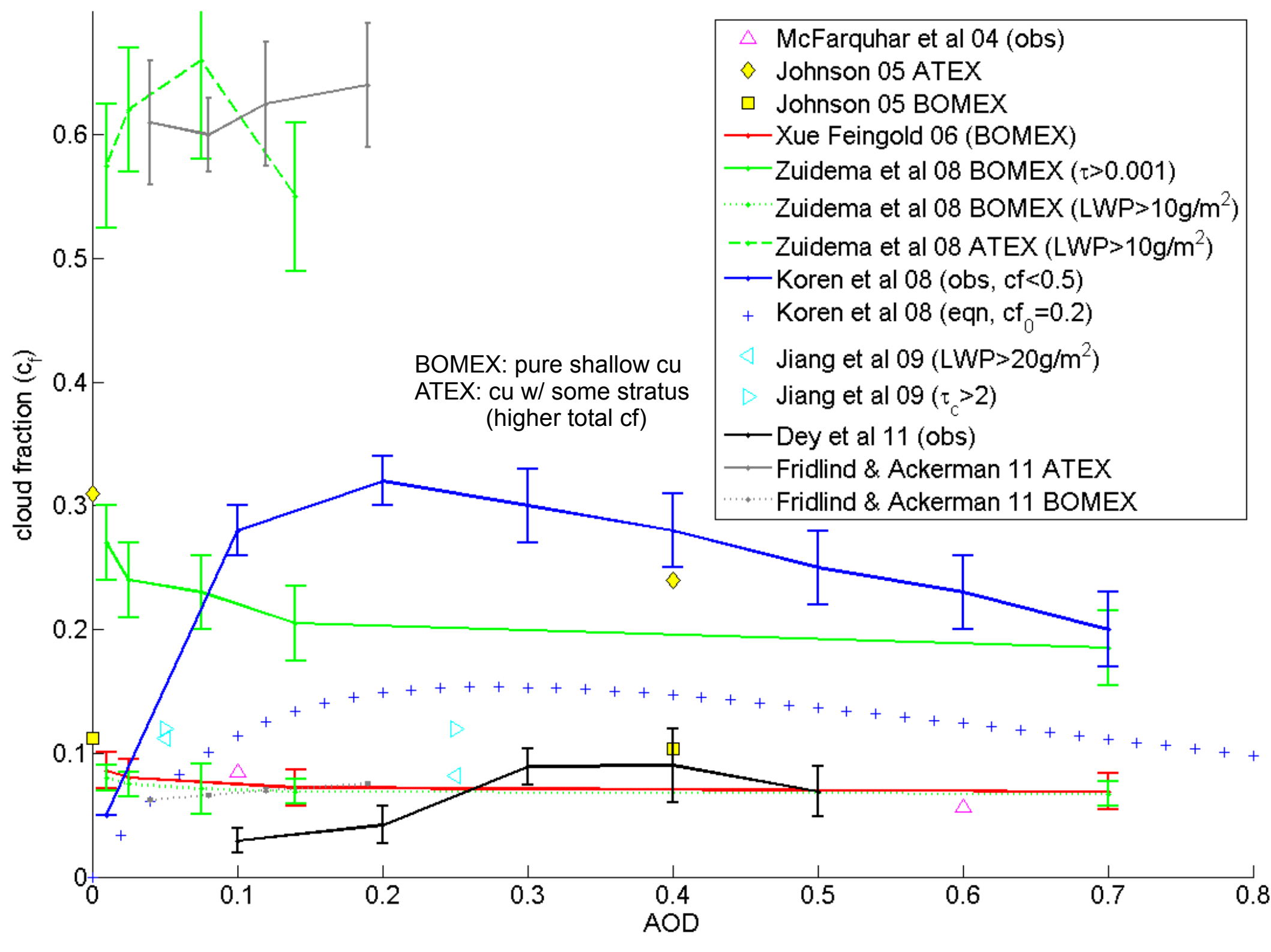
McFarquhar et al 04 (obs)
Johnson 05 ATEX
Johnson 05 BOMEX
Xue Feingold 06 (BOMEX)
Zuidema et al 08 BOMEX (τ>0.001)
Zuidema et al 08 BOMEX (LWP>10g/m2)
Zuidema et al 08 ATEX (LWP>10g/m2)
Koren et al 08 (obs, cf<0.5)
Koren et al 08 (eqn, cf0=0.2)
Jiang et al 09 (LWP>20g/m2)
Jiang et al 09 (τc>2)
Dey et al 11 (obs)
Fridlind & Ackerman 11 ATEX
Fridlind & Ackerman 11 BOMEX
BOMEX: pure shallow cu
ATEX: cu w/ some stratus
(higher total cf)
cloud fraction (cf)
AOD
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

Reference	Platform/ Methodology	Main finding	Important assumptions
McFarquhar et al 2004	Observation-based: INDOEX C-130; MISR	Small-area clouds (<2km) contribute up to 40% of cloud area, and are a larger fraction of pristine clouds (less small polluted clds); pristine clouds have higher cld tops; **total cf decreases with increased Na**	pristine=Na<500/cm3; polluted = Na>1500/cm3. UAV CPC 500 (1500)/cm3 ~ AERONET AOD500 ~0.15(~0.5)
Johnson 2005	Modeling (LES), intermediate and pure trade cu	**Decrease in cf** and LWP between control and high-aerosol simulations for both intermediate and pure trade cu; greater decrease in cf for int than pure regime	Focused on semidir eff: dry aerosol ext mixture of (NH4)2SO4 and BC
Xue and Feingold 2006	Modeling (LES), initialized by BOMEX	Warm trade cu: **decreased cf**, cld size, z_cldtop **with increased aerosol**; increased LWP, precip suppression	clean=Na=25mg-1; polluted=Na=2000mg-1; cf defined as LWP>10g/m2
Jiang et al 2009	LES of trade cu; results for last 6hr of model run	cf is dependent on model resolution (higher for higher res). Polluted: more small, short-lived clouds w/ higher LWC; overall **decreased cf w/ inc aerosol**	Clean = 100/cm3; polluted=1000/cm3; "cld" defined as LWP>20g/m2. 20/80% in/soluble aerosol
Zuidema et al 2008	Modeling (MC RTM) shallow marine cu; ATEX, BOMEX	**Inc aerosol = decreased cf**, cld size, ↑ cld optical depth due to ↓ precip, ↑ mixing. Increased albedo; med→high aerosol= greater ↑ in albedo than low→med aerosol	Aerosol given as Na (25, 50, 100, 450, 2000); no absorbing aerosols, indir effs only
Koren et al 2008	Model, observations (MODIS retrievals of Amazon clouds)	Parameterized cf as a function of AOD, **dependent on cf0** and combination of semidir and indir effects. Obs data matched well, esp for low fc.	Both aerosol and cloud retrievals from same satellite product
Dey et al 2011	Satellites (MISR (18k, ASTER (15m)), Nov 06-Apr 07, Indian O	**cf exhibits u-shape**, highest btwn 0.3<AOD<0.45. Cloud top height for AOD>0.4 lower than hct for lower AOD. Large AOD has larger size clouds (semidir eff?)	Possible met influences: stat-significant decrease in PWV, increased subsidence for increased AOD(different ranges)
Loeb and Schuster 2008	Satellite (CERES, MODIS, QuikSCAT) broken, low-level clds off African Atl coast	**Larger AOD=greater cf**, FMF, AE, SW TOA flux, cloud top height CLWP; same PW, wind field, SST; rejects met, AOD cld-contamination, warns aerosol-cloud correlations could be due to ↑AOD, cld amt w/ RH	Restricted to sulfate dominated regions (defined by model); MODIS-sized aerosol footprint
Fridlind and Ackerman 2011	LES model to assess satellite observations; ATEX, BOMEX, RICO	Aerosol decreased LWP for ATEX, ~cte for BOMEX; in pure cu, CRF ~8W/m2, low →med aerosol has greater forcing than med→high. **Cf increases with Na**	Aerosol in accumulation mode corr w/ aer in Aitken mode; single-mode lognormal distrib
Yuan et al 2011	A-train obs (MODIS, CALIOP, OMI, CloudSat), <2km SO2 plume from Kilauea	**Cloud fraction increased with AI**, higher cld optical depth, higher cld top height, increased albedo; attributed to precip suppression; larger clouds for polluted cond; decr sfc->atm LH transfer; 20W/m2 SW indir forcing	Nonabsorbing aerosols only; orographic mean flow effs from volcano; MODIS resolution is coarser than many clouds (10km)