Inter-comparison questions

- Review of existing inter-comparisons
- -> can we identify gaps?
  - What to compare / which focus
  - Which reference datasets
  - Which metrics
  - Which approach (experiments, statistics, sensitivities, information content, synthetic simulations, …)
- Can we define additional meaningful exercise(s)?
  - -> seek funding

Inter-comparison ongoing table (ocean and dust)

publication	variables	method(s)	sensors														period	regions	references
			VIIRS	SeaWIFS	AVHRR	TOMS	MODIS	MISR	POLDER	AATSR	MERIS	SYNAER	OMI	AIRS	IASI	CALIOP	SEVIRI			
Smirnov, et al. (2011), AMT, 4, 583-597, doi:10.5194/amt-4-583-2011	AOD	Lv2 statistics					x	x										2006-2010 (80 cruises)	Global oceans	MAN
Kinne, S. (2009), edited by A.Kokhanovsky and G. de Leeuw, Springer ISBN: 978-3-540-69396-3	AOD	L3 scoring	various algorithms for one sensor		x	x	x	x	x									Various multi-annual	Global ocean; regions	AERONET, SKYNET
Myhre, et al., (2005), ACP, 5, 1697-1719, doi:10.5194/acp-5-1697-2005	AOD	Monthly means		x	x	x	x	x				x						Various, 1997-2000 / 8M of 2000	Global oceans; regions	AERONET, campaigns
Sayer, et al., (2012), JGR, 117, D03206, doi:10.1029/2011JD016599	AOD	Lv3		x			x	x		x	x							Multi-year	Global ocean	AERONET
Kahn, et al. (2007)., JGR, 112, D18205, doi:10.1029/2006JD008175.	AOD, ANG, size distribution, refr indices	L2					x	x										2001-2005 case studies	Over-water case studies	AERONET
Carboni, et al. (2012), AMT, 5, 1973-2002, doi:10.5194/amt-5-1973-2012	Dust AOD	L3 statistics					various algorithms for one sensor										x	March 2006	Saharan Dust Plume	AERONET
Banks, et al. (2013), RSE, 136, 99-116, doi: 10.1016/j.rse.2013.05.003	Dust AOD	Lv2 statistics					x	x							x		x	June 2011	Sahara	AERONET + Fennek campaign (ground, air, lidar)

Inter-comparison ongoing table (land)

Publication	variables	method(s)	sensors														period	region(s)	reference(s)
			VIIRS	SeaWIFS	AVHRR	TOMS	MODIS	MISR	POLDER	AATSR	MERIS	SYNAER	OMI	AIRS	IASI	CALIOP	SEVIRI			
Kahn et al. (2011), JQSRT, 112:901–909. doi:10.1016/j.jqsrt.2009.11.003	AOD	L2 statistics					x	x										3 months 2006	Global	-
Liu, et al. (2014), JGR, 119, 3942–3962, doi:10.1002/2013JD020360.	AOD	L2 statistics	x				x											2012/13	global	AERONET, MAN
Kinne, et al. (2003), JGR, 108, 4634, doi:10.1029/2001JD001253	AOD	Monthly means			x	x	x												global	AERONET, AEROCOM
Kittaka et al. (2011), AMT, 4, 131–141, doi:10.5194/amt-4-131-2011	AOD	Collocated pairs, 5 deg					x									x		2006-2008	global	-
Sayer, et al. (2012), AMT, 5, 1761, doi:10.5194/amt-5-1761-2012	AOD	Lv3		x			x	x										Multi-year	global	AERONET
Redemann, et al. (2012), ACP 12, 3025-3043, doi:10.5194/acp-12-3025-2012, 2012	AOD	L2					x									x		4M 2007 & 2009	Global CALIOP tracks	-
Carlson and Lacis (2013), JGR, 118, 8640–8648, doi:10.1002/jgrd.50686	AOD	PCA analysis		x			x	x										2002-2010	Global ocean	-
Kahn,et al. (2009), TGARS 47, 4095-4111, doi: 10.1109/TGRS.2009.2023115	AOD, ANG	L2 statistics					x	x										2M of 2006	Global	-
Bréon,et al., (2011), RSE 115, 3102	AOD, ANG	L2 statistics					x		x		x					x	x	various,	global; sea/land	AERONET
de Leeuw, et al., RSE (2014) doi: 10.1016/j.rse.2013.04.023	AOD, ANG	Lv2 / L3 L3 scoring					x	x	x	x	x	x						4M of 2008	global;,	AERONET
Holzer-Popp, et al., AMT, 6, 1919 - 1957, (2013) doi:10.5194/amt-6-1919-2013	AOD, ANG	L3 statistics algorithm experiment					x	x	x	x	x	x						1M of 2008	Global; regions	AERONET
Kokhanovsky, et al. (2010), AMT, 3, 909-932, doi:10.5194/amt-3-909-2010	AOD, optical properties	Single cases					x	x	x	x	x							Single cases	Single cases	Simulations

various algorithms for one sensor

various algorithms for one sensor

various algorithms for one sensor

Inter-comparison potential gaps

- aerosol properties: fine mode AOD / ANG, AAOD
- Frequency / capability of detecting high AOD episodes / spatial variability / plumes (DRAGON networks / DISCOVER-AQ)
- PDFs instead of mean aerosol state
- Information content / PCA analysis / simulated scenes based on CTM

- geostationary (several SEVIRI algorithms; include Asian data)
- (regional) trends and anomalies (using same time windows, same background period)
- Climatologies of AOD (and aerosol properties)

Discussion points

- AEROSAT experiments (sensitivities)
- Combine Aerosol_cci and GEWEX phase 2 assessments (lv2) relying also on Giovanni / AEROSTAT
- user of comparison study: retrieval improvement / consistency documented for end users
- Documentation (ATBD, obs4MIPS 5 page technical note)
- Reference datasets: sampling typical air mass aerosol properties by repeated airborne campaigns

- User requests
  - overview table of sat aerosol products (-> WMO-GAW one stop shop)
  - E-Mail list to ask questions / help (e.g. which products suit case study?)
  - Collaboration of modelers and satellite people in comparisons