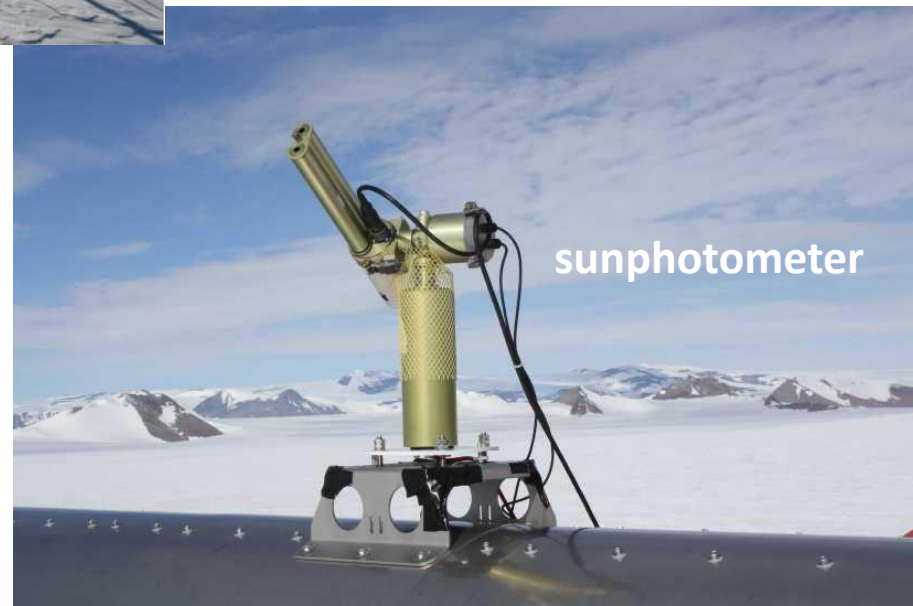
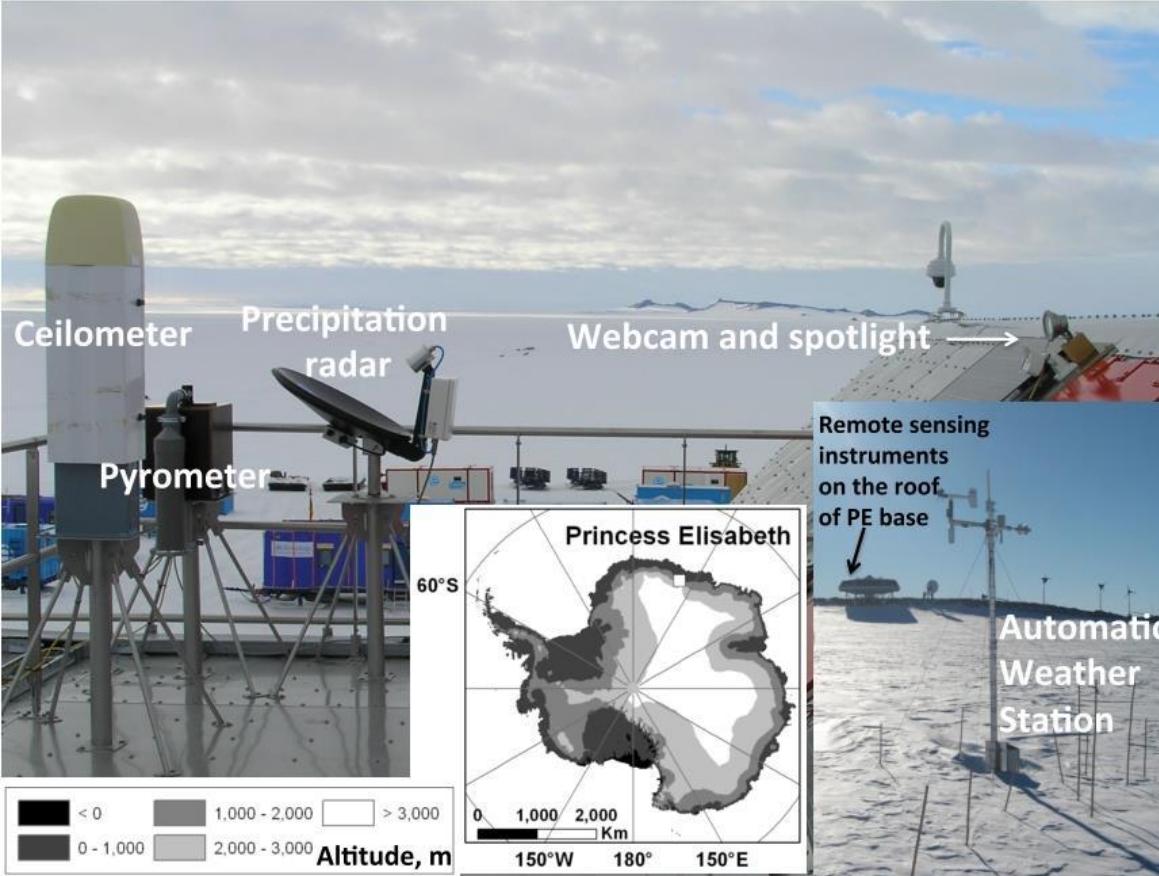


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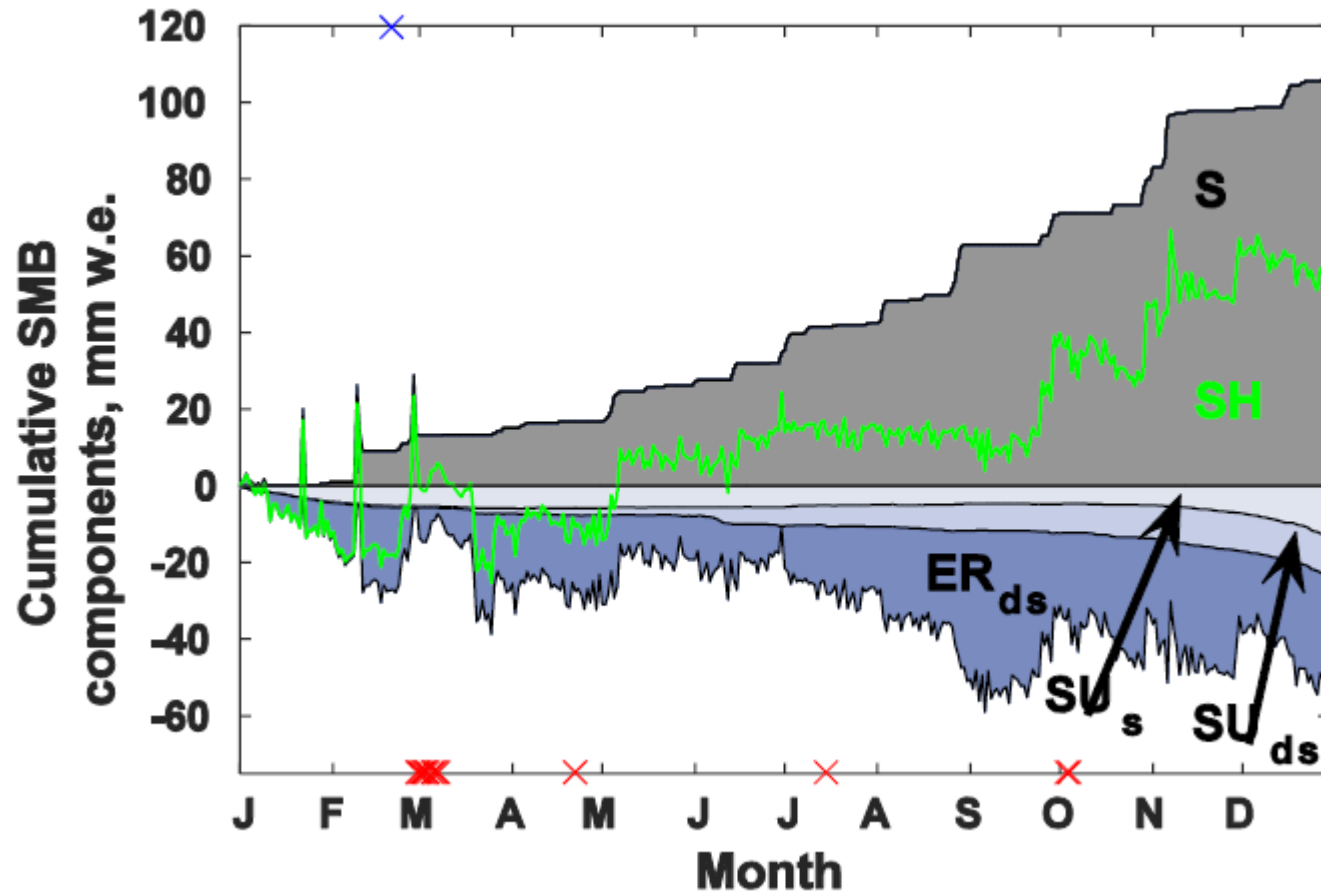
28-04-2016

AEROCLOUD project

- Collaboration between KU Leuven, Belgian Meteorological Service and the Belgian Institute for Space Aeronomy
- What is the role of clouds and aerosols in the East Antarctic climate system?
- What is the relation between aerosols and clouds in East Antarctica?



Surface Mass Balance at PE for 2012

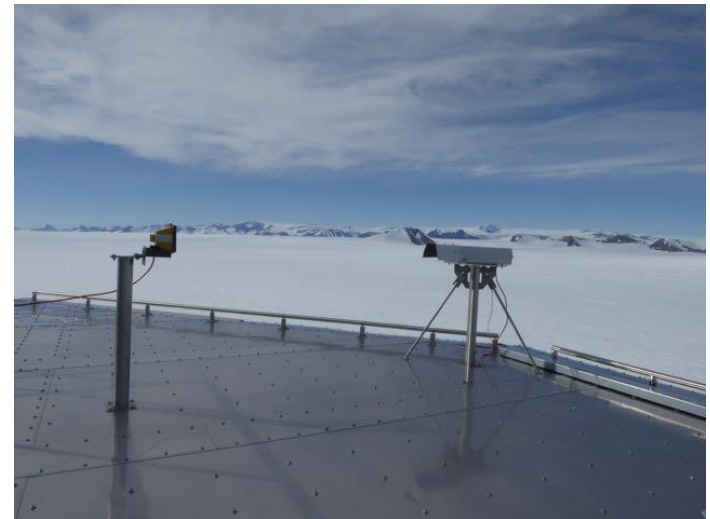


Two main unknowns

- Snow height

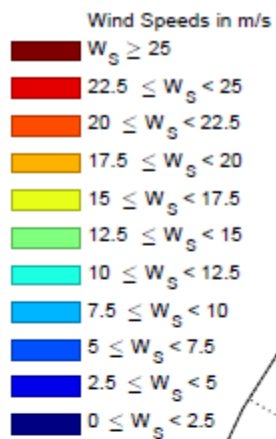


- Precipitation

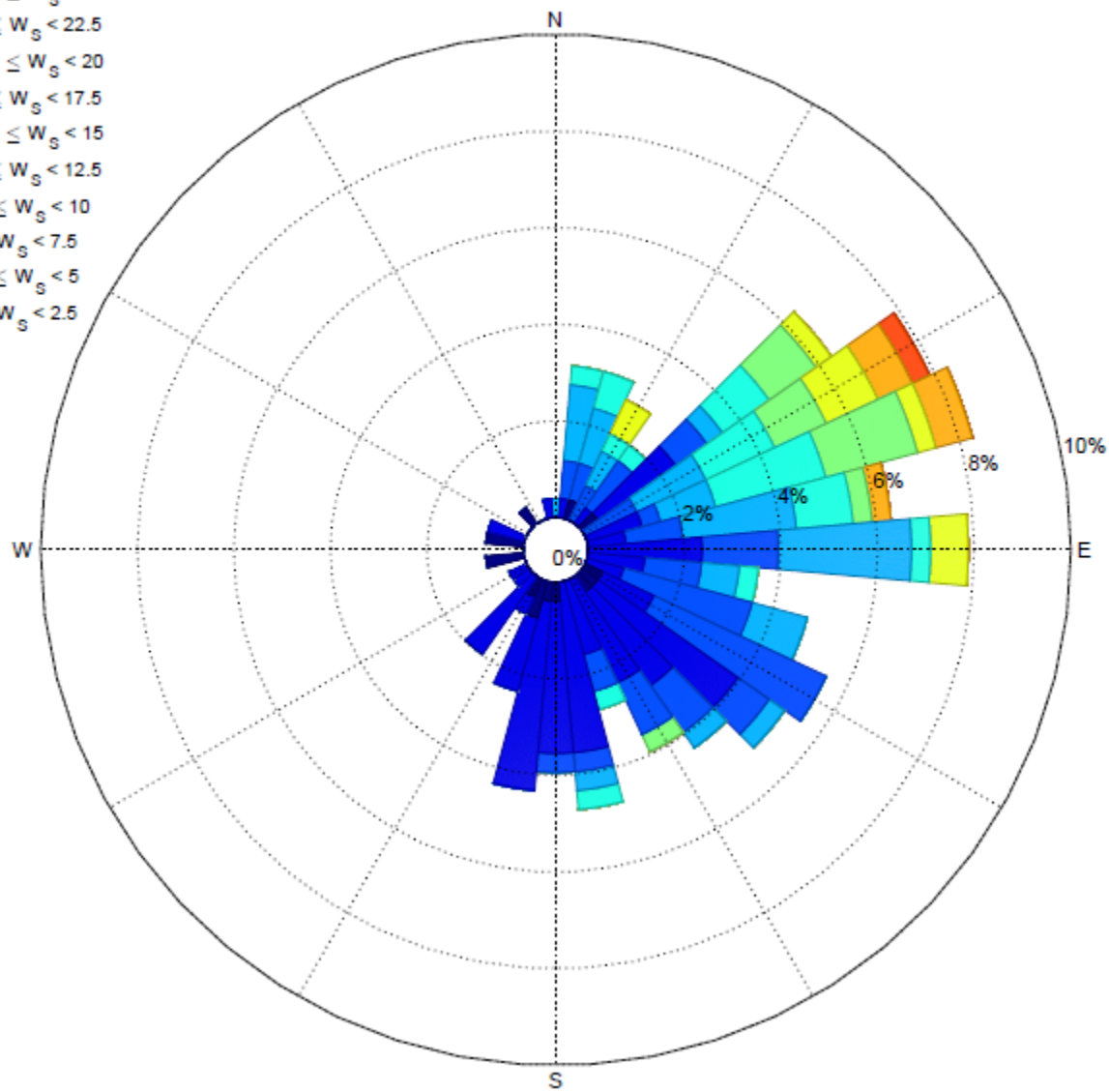


Gain insight in accumulation / ablation

- Look in detail at four different types of events (period 2010-2014):
 - Pr > 1 mm, Acc > 0.5 cm (N=47)
 - Pr < 1 mm, Acc > 0.5 cm (N=81)
 - Pr > 1 mm, Acc < -0.5 cm (N=27)
 - Pr < 1 mm, Acc < -0.5 cm (N=99)



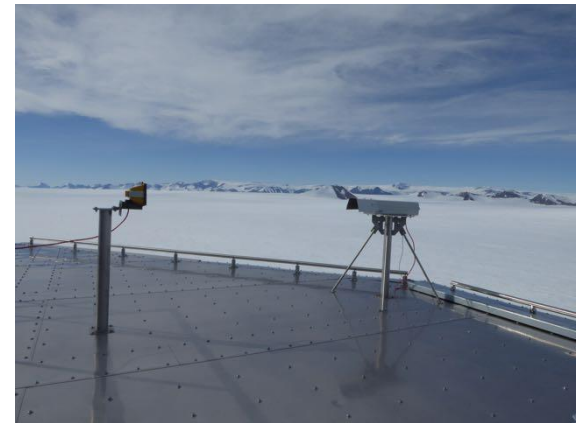
Wind Rose, N=254



	Acc +, Pr +	Acc +, Pr 0	Acc -, Pr +	Acc -, Pr 0
Mean wind speed (m/s)	10.1	6.1	10.5	5.4
Mean wind direction (° N)	78.0	107.3	61.4	129.8
Std wind speed (m/s)	22.2	23.4	13.1	35.4
Mean pressure (Pa)	831.6	828.3	832.6	830.2
Mean q (g/kg)	1.5	0.8	1.7	0.9
Mean Tinv (K)	1.4	5.2	1.2	5.9
Mean dLW (W/m ²)	-78.4	-26.9	-78.5	-20.6
Mean dSW (W/m ²)	99.2	31.5	95.2	34.7
Mean duration of the cloud structure (hours)	42.6	26.3	26.7	26.0
Mean precipitation (mm)	3.3	0.1	2.4	0.0

Lower precipitation uncertainty

- Precipitation is now calculated as the ‘average’ of 9 existing Ze-SR relations
- By use of the SVI we get:
 - Particle characteristics
 - Fall speed distribution
- This allows to calculate Ze and SR when assuming backscatter cross section and $m(D)$ relation



$$Z_e = 10^{18} \cdot \frac{\lambda^4}{\pi^5 \cdot |K|^2} \int_{D_{\min}}^{D_{\max}} \sigma(D) N(D) dD$$

$$S = \rho_w^{-1} \int_{D_{\min}}^{D_{\max}} m(D) v_f(D) N(D) dD,$$

- Only pure precipitation events (no blowing snow) → 11 days since January 2016

