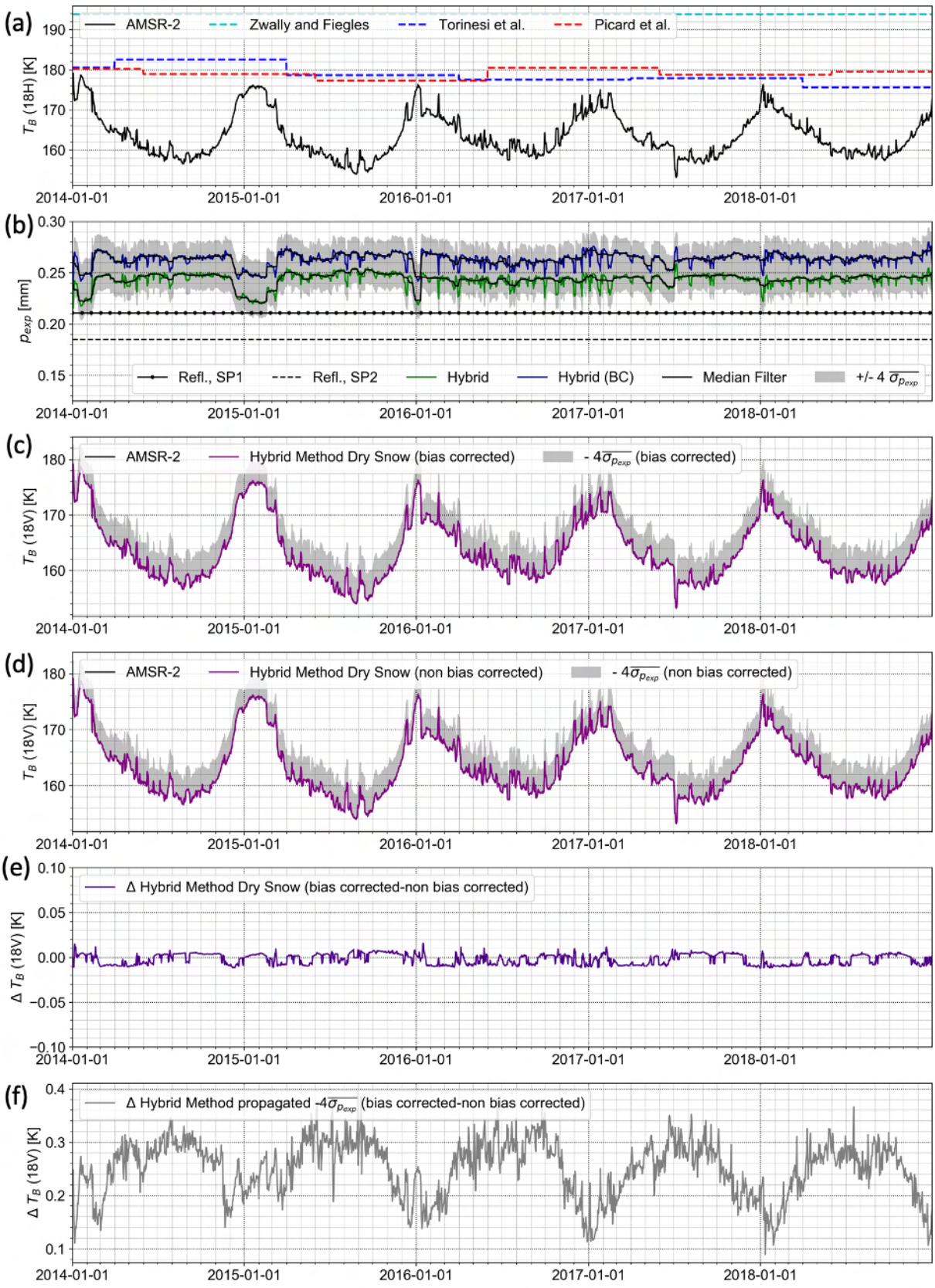
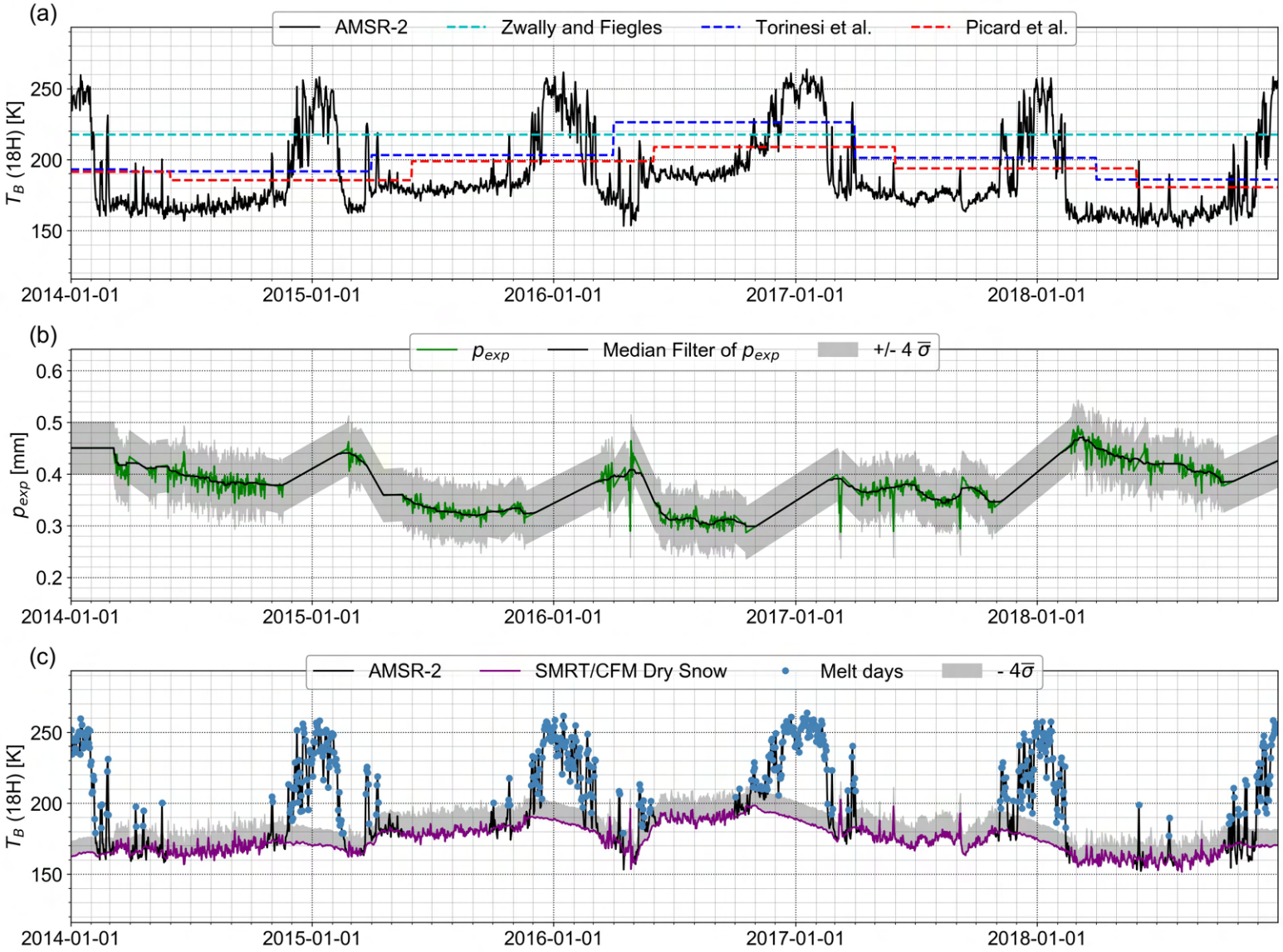
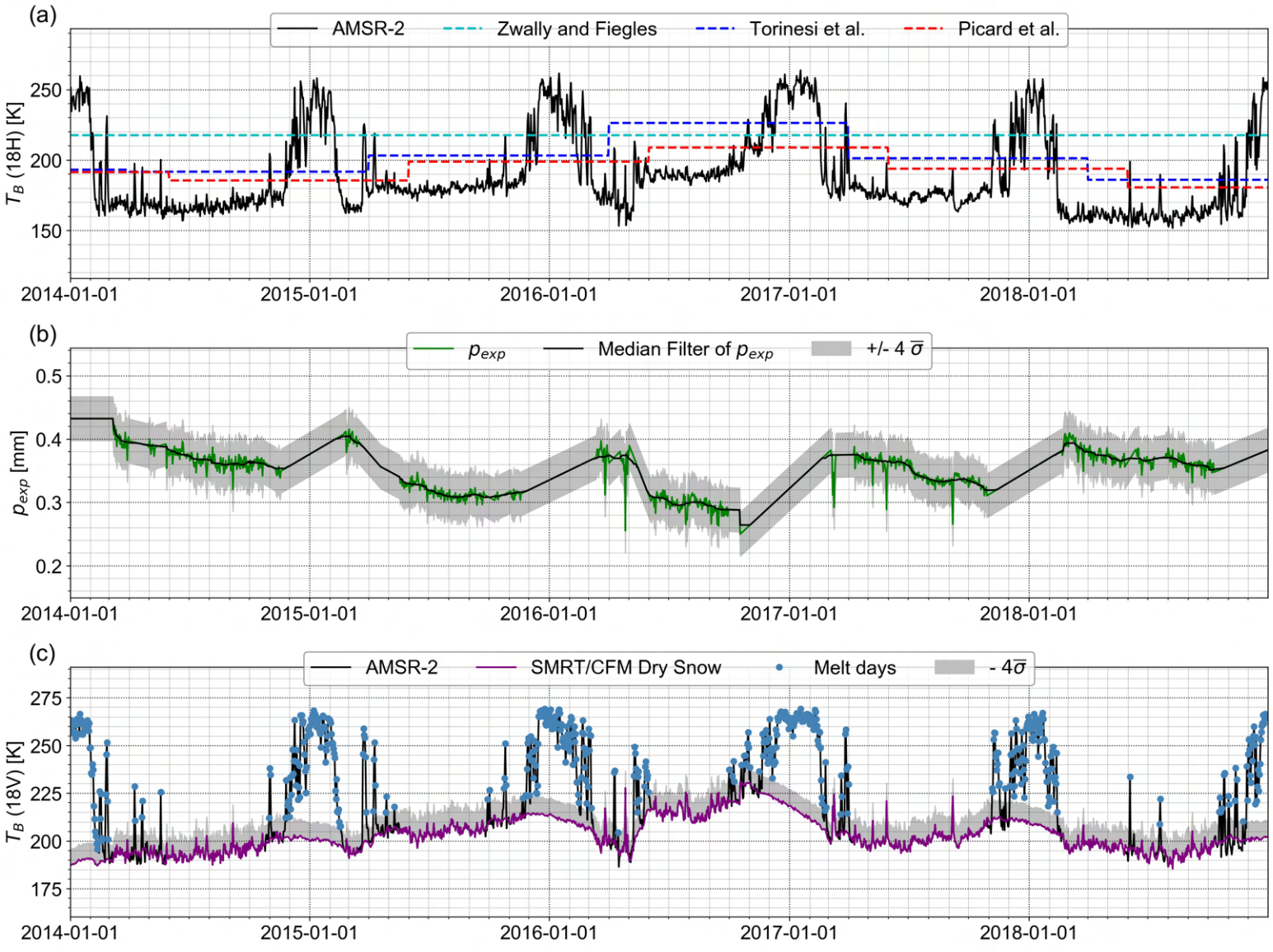

(a)
AMSR-2
Zwally and Fiegles
Torinesi et al.
Picard et al.
T_B (18H) [K]
(b)
ρ_{exp} [mm]
Refl., SP1
Refl., SP2
Hybrid
Hybrid (BC)
Median Filter
+/- 4 $\overline{\sigma_{\rho_{exp}}}$
(c)
AMSR-2
Hybrid Method Dry Snow (bias corrected)
- 4$\overline{\sigma_{\rho_{exp}}}$ (bias corrected)
T_B (18V) [K]
(d)
AMSR-2
Hybrid Method Dry Snow (non bias corrected)
- 4$\overline{\sigma_{\rho_{exp}}}$ (non bias corrected)
T_B (18V) [K]
(e)
Δ Hybrid Method Dry Snow (bias corrected-non bias corrected)
Δ T_B (18V) [K]
(f)
Δ Hybrid Method propagated -4$\overline{\sigma_{\rho_{exp}}}$ (bias corrected-non bias corrected)
Δ T_B (18V) [K]
2014-01-01
2015-01-01
2016-01-01
2017-01-01
2018-01-01

Figure S1: Same as Figure 3 from the main text, except using the 18H channel for all derivations. Dome C (a) Brightness temperature from AMSR-2 (18H; black line) with thresholding techniques from Zwally and Fiegles (1994; cyan line), Torinesi et al. (2003; blue line), and Picard et al. (2022a; red line). (b) Correlation length converted from NIR SSA values in Brucker et al. (2011) assuming a 4 m penetration depth (black dotted line) and a 10 m penetration depth (black dashed line). Correlation length computed from the hybrid method (18H; green line) and the hybrid method BC version (navy line) along with grey bounds that represent $4\overline{\sigma_{p_{exp}}}$. (c) AMSR-2 brightness temperature (18H; black line). Hybrid method dry snow brightness temperature, BC version (18H; purple line) along with propagated $4\overline{\sigma_{p_{exp}}}$. (d) Same as (c) but for non-BC version. (e) The difference between the hybrid method's dry snow brightness temperature BC and non-BC versions (18H; purple line). (f) The difference between propagated $4\overline{\sigma_{p_{exp}}}$ between the BC and non-BC versions (grey line).

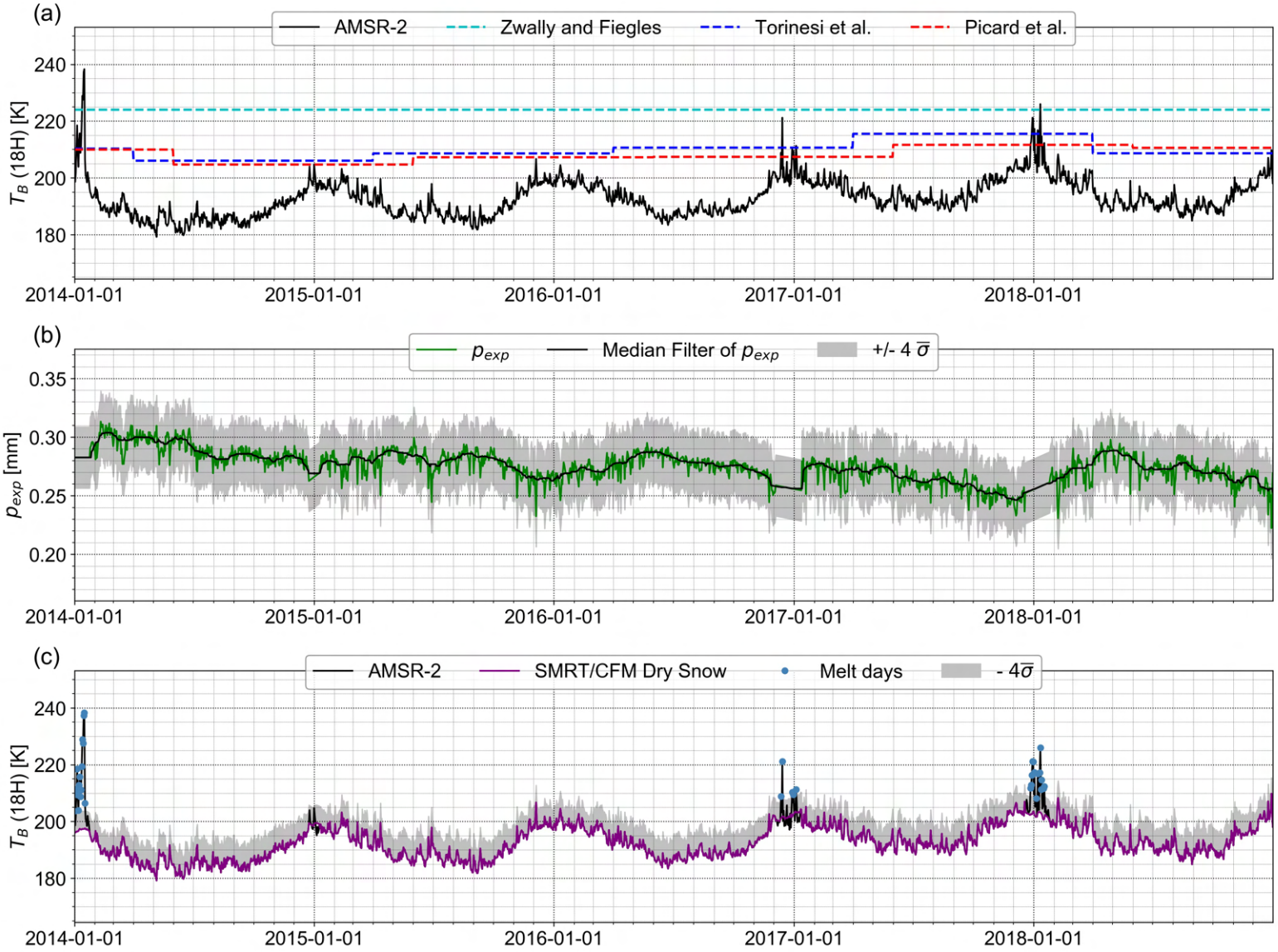
Figures S2 to S31 (See following pages): Data from AWS site listed in plot title. (a) Brightness temperature from 18H from AMSR-2 (black line) with thresholding techniques from Zwally and Fiegles (1994; cyan line), Torinesi et al. (2003; blue line), and Picard et al. (2022a; red line). (b) The exponential correlation length computed from the hybrid method (green line) along with +/- $4\overline{\sigma_{p_{exp}}}$ bounds, with median filter (black line). (c) AMSR-2 brightness temperature (18H; black line). Hybrid method dry snow brightness temperature (channel as listed in plot title; purple line) with propagated $4\overline{\sigma_{p_{exp}}}$ (grey bounds). Melt days detected by hybrid method (blue dots).


Site: AWS 18, Channel: 18H
(a)
AMSR-2
Zwally and Fiegles
Torinesi et al.
Picard et al.
T_B (18H) [K]
250
200
150
2014-01-01
2015-01-01
2016-01-01
2017-01-01
2018-01-01
(b)
p_{exp}
Median Filter of p_{exp}
+/- 4 $\overline{\sigma}$
p_{exp} [mm]
0.6
0.5
0.4
0.3
0.2
2014-01-01
2015-01-01
2016-01-01
2017-01-01
2018-01-01
(c)
AMSR-2
SMRT/CFM Dry Snow
Melt days
- 4$\overline{\sigma}$
T_B (18H) [K]
250
200
150
2014-01-01
2015-01-01
2016-01-01
2017-01-01
2018-01-01

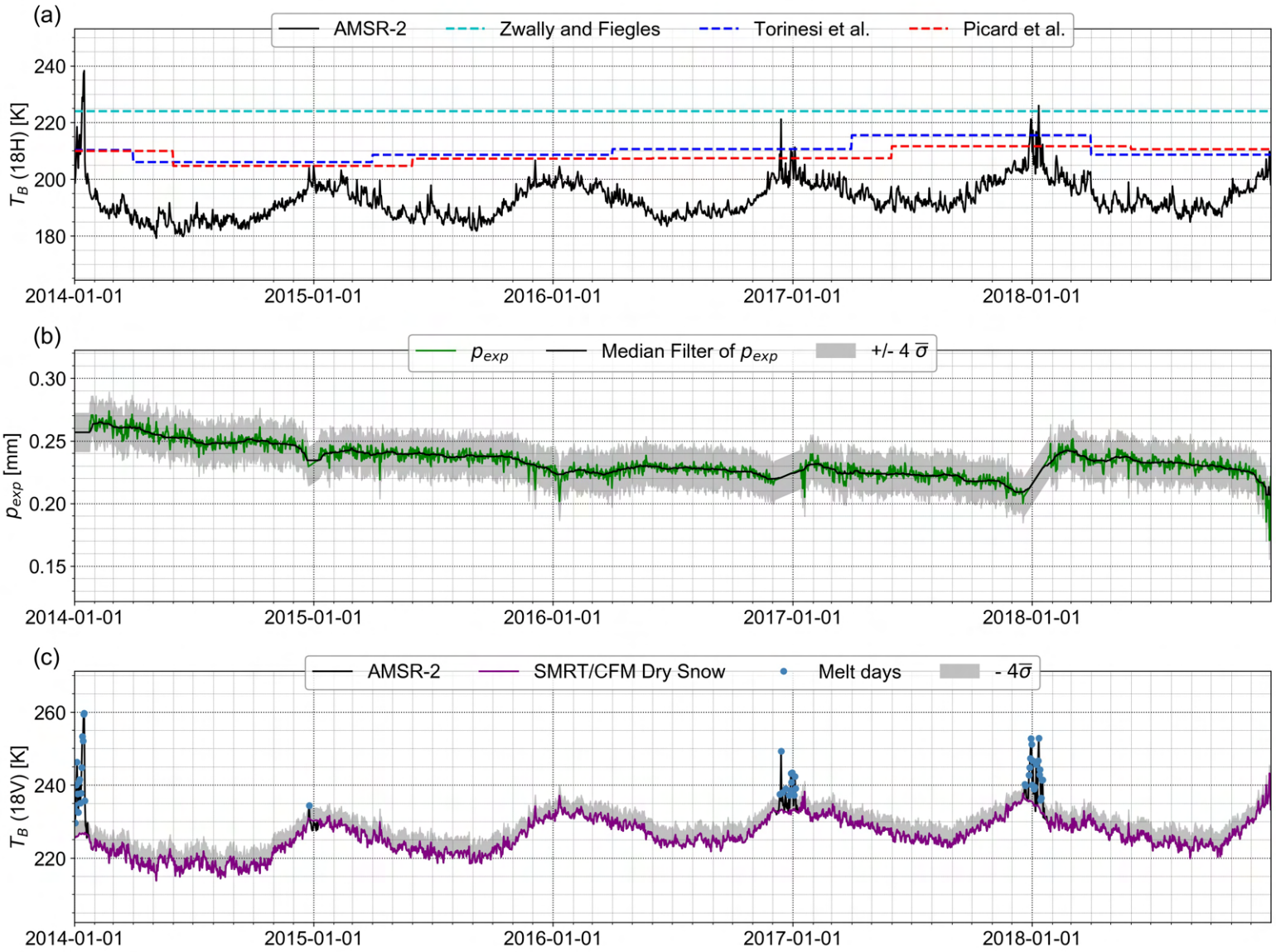
Site: AWS 18, Channel: 18V



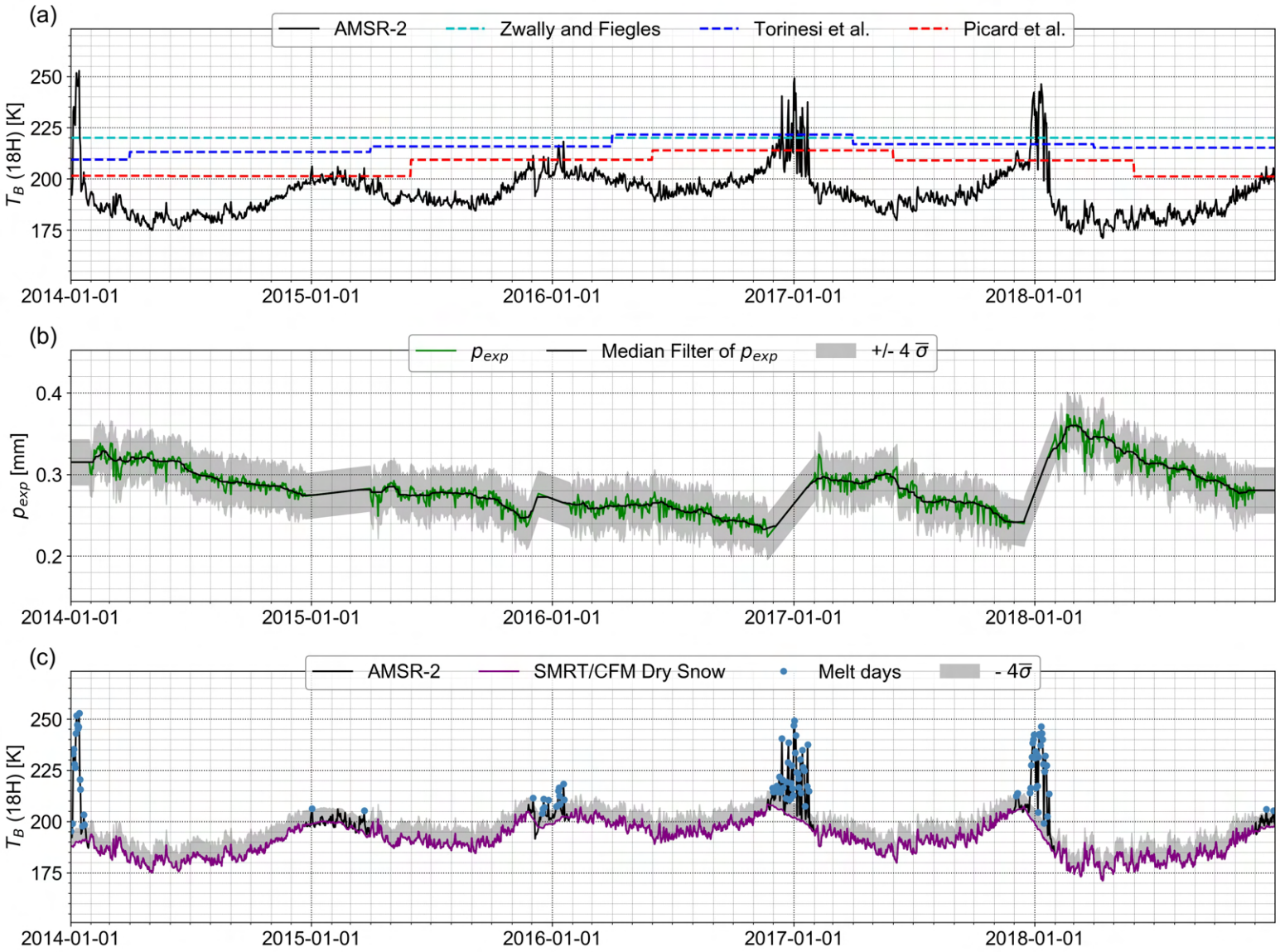
Site: AWS 5, Channel: 18H



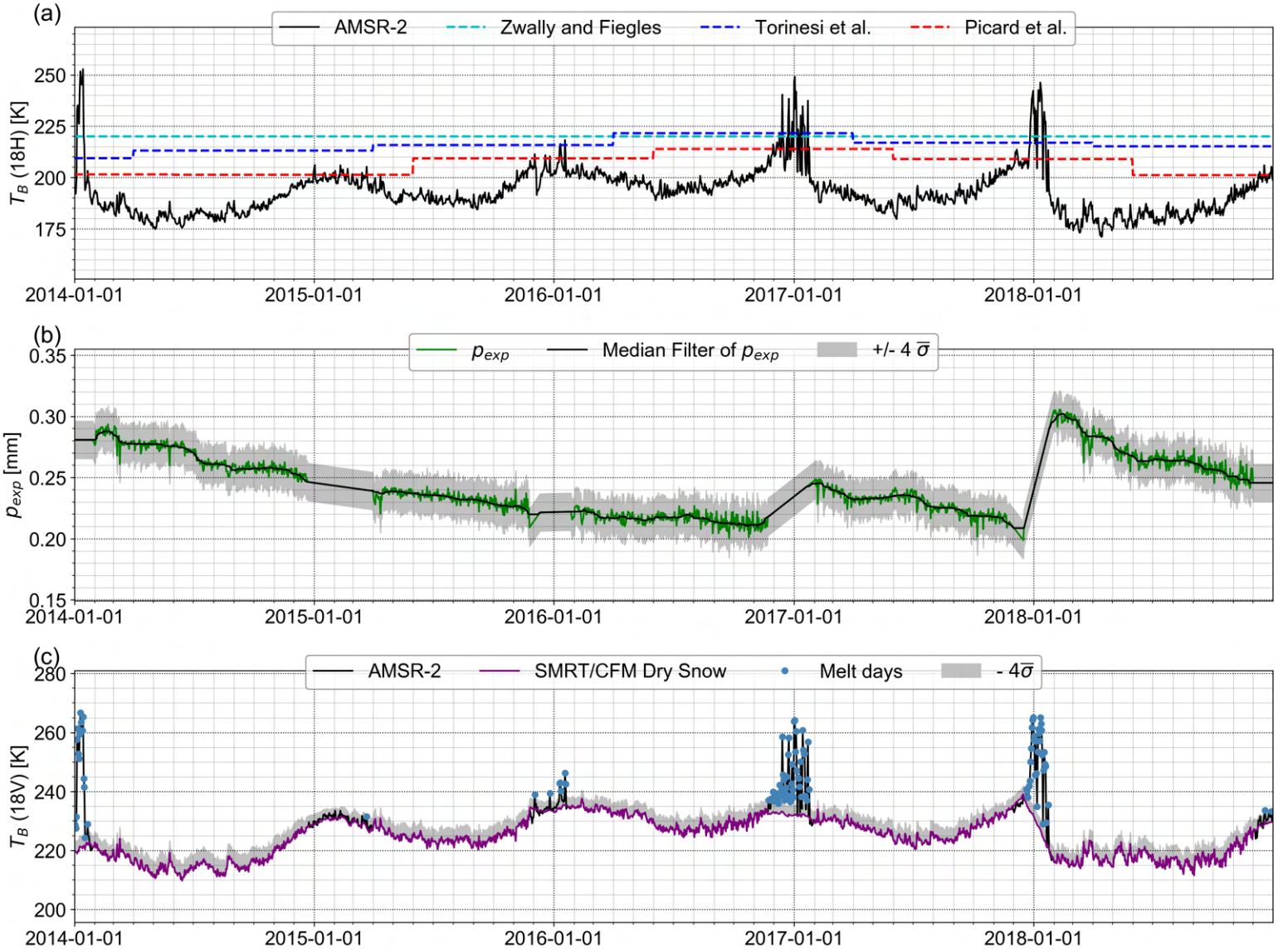
Site: AWS 5, Channel: 18V



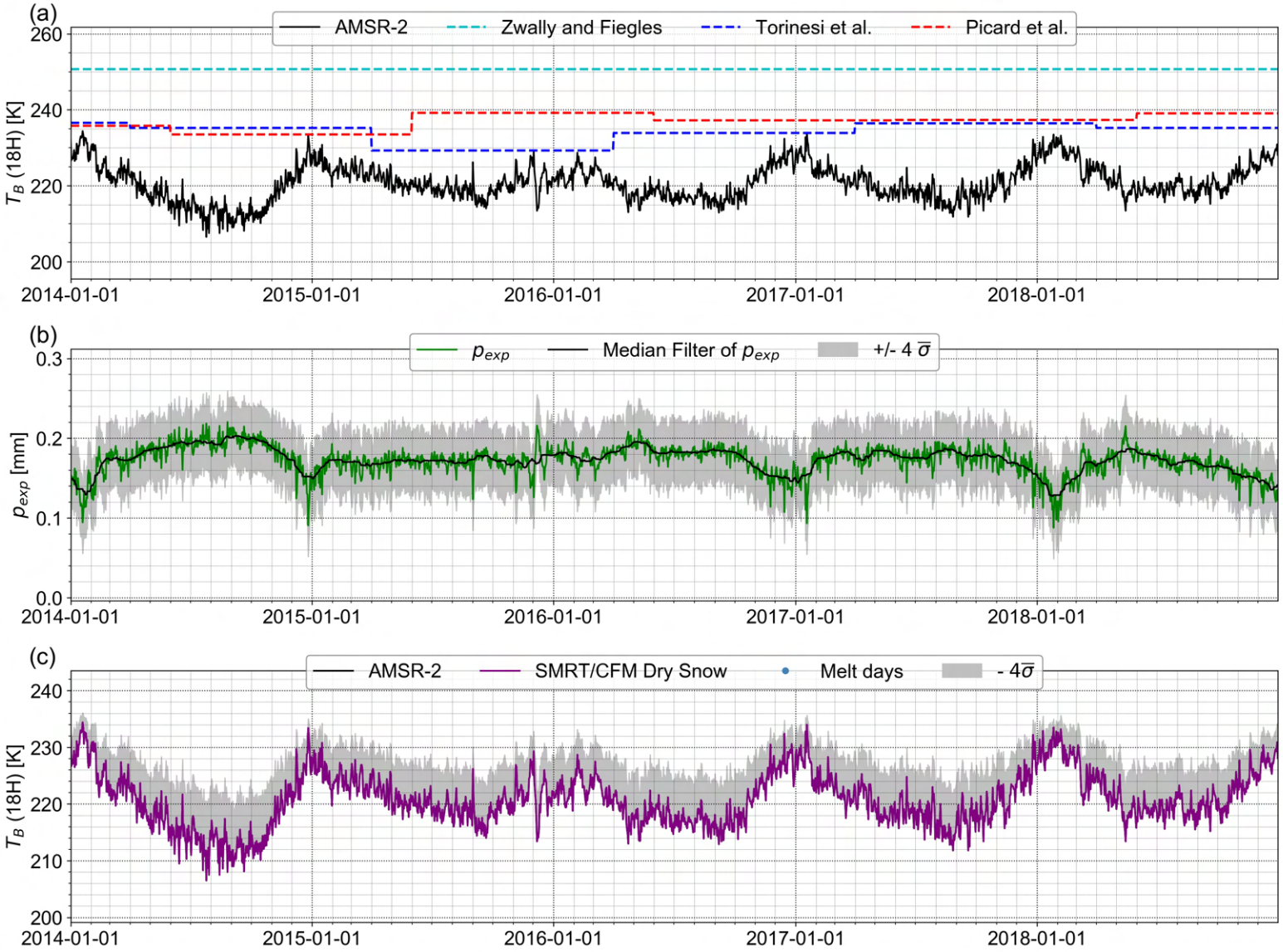
Site: AWS 4, Channel: 18H



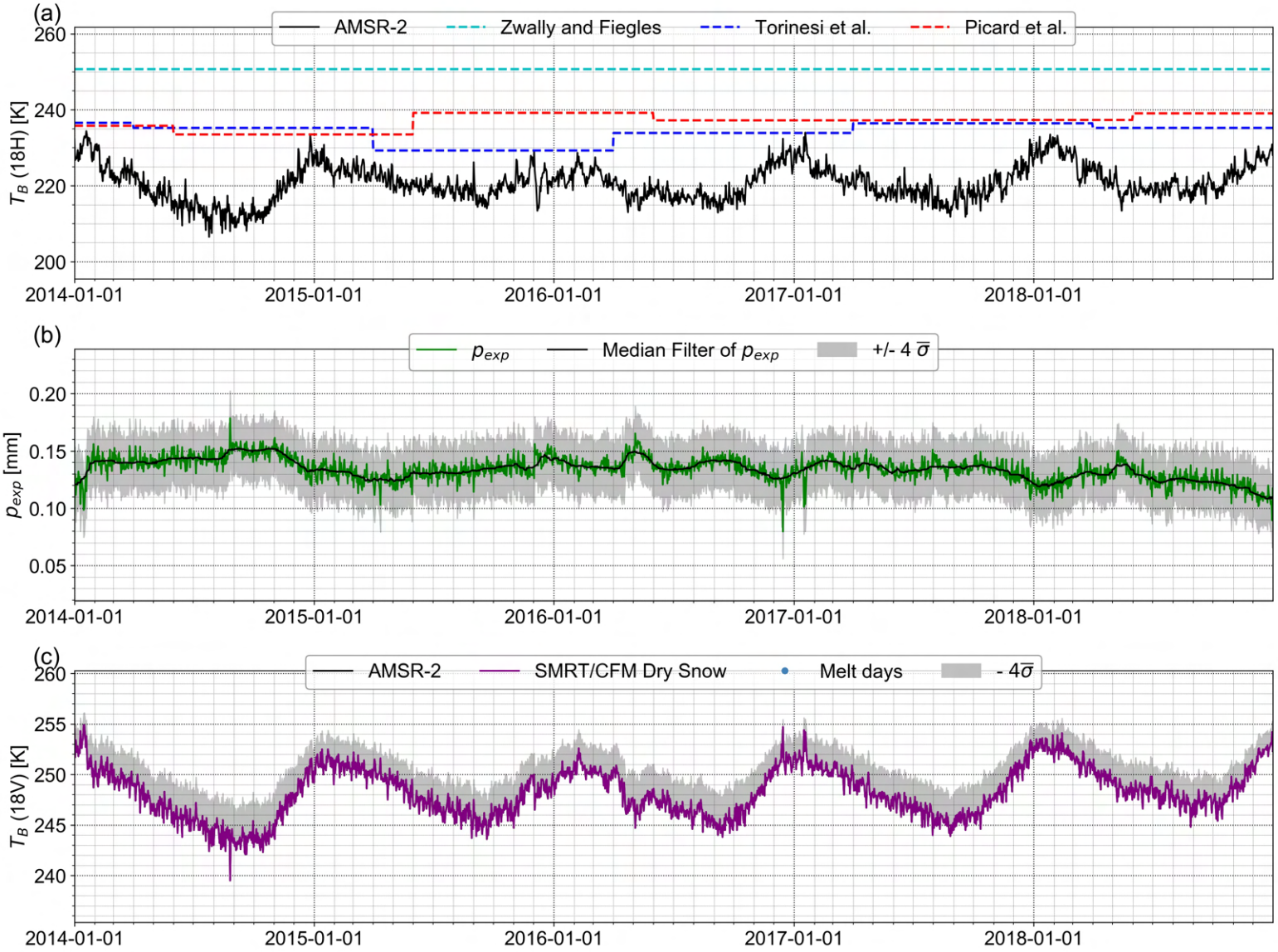
Site: AWS 4, Channel: 18V



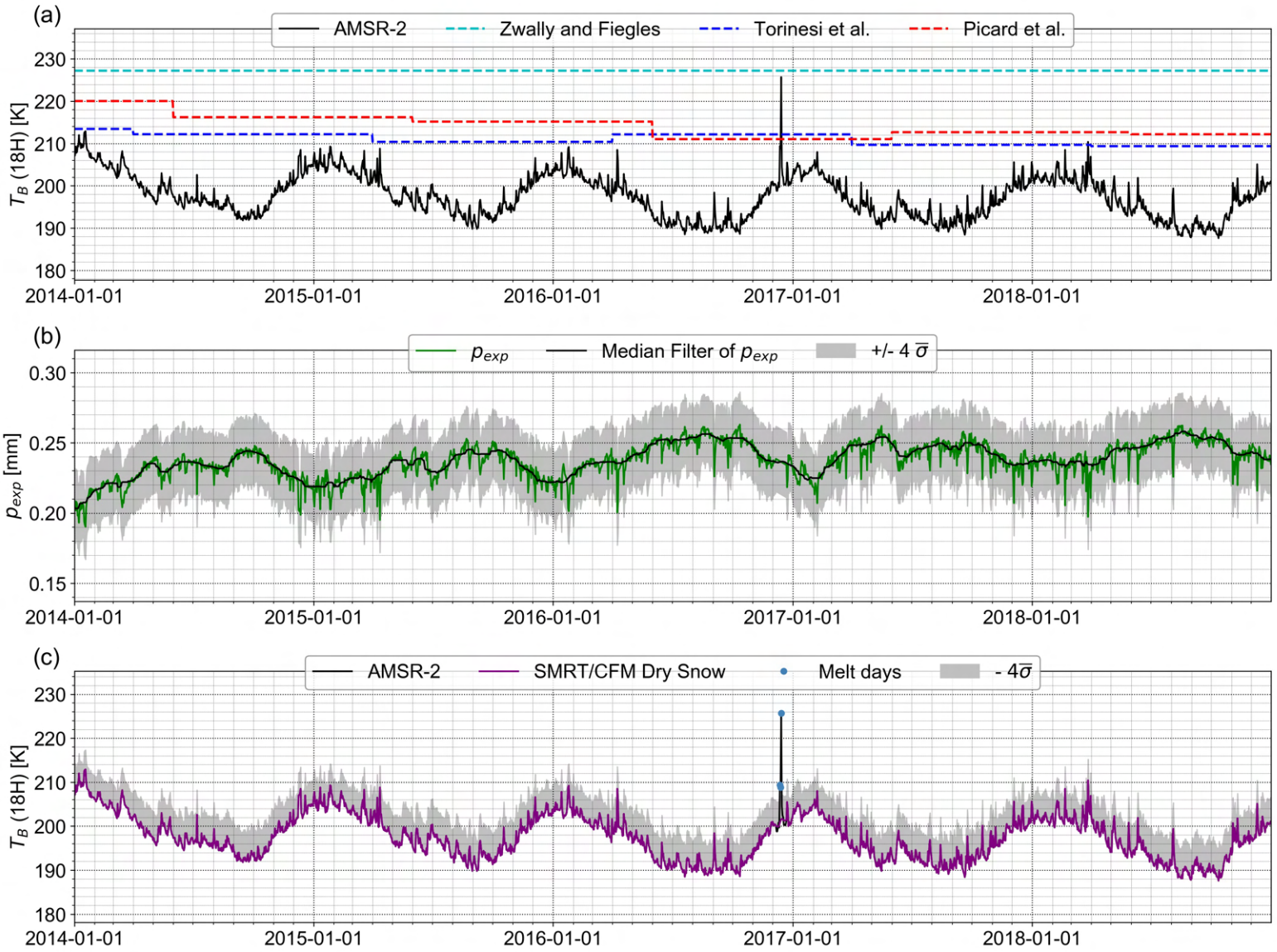
Site: AWS 11, Channel: 18H



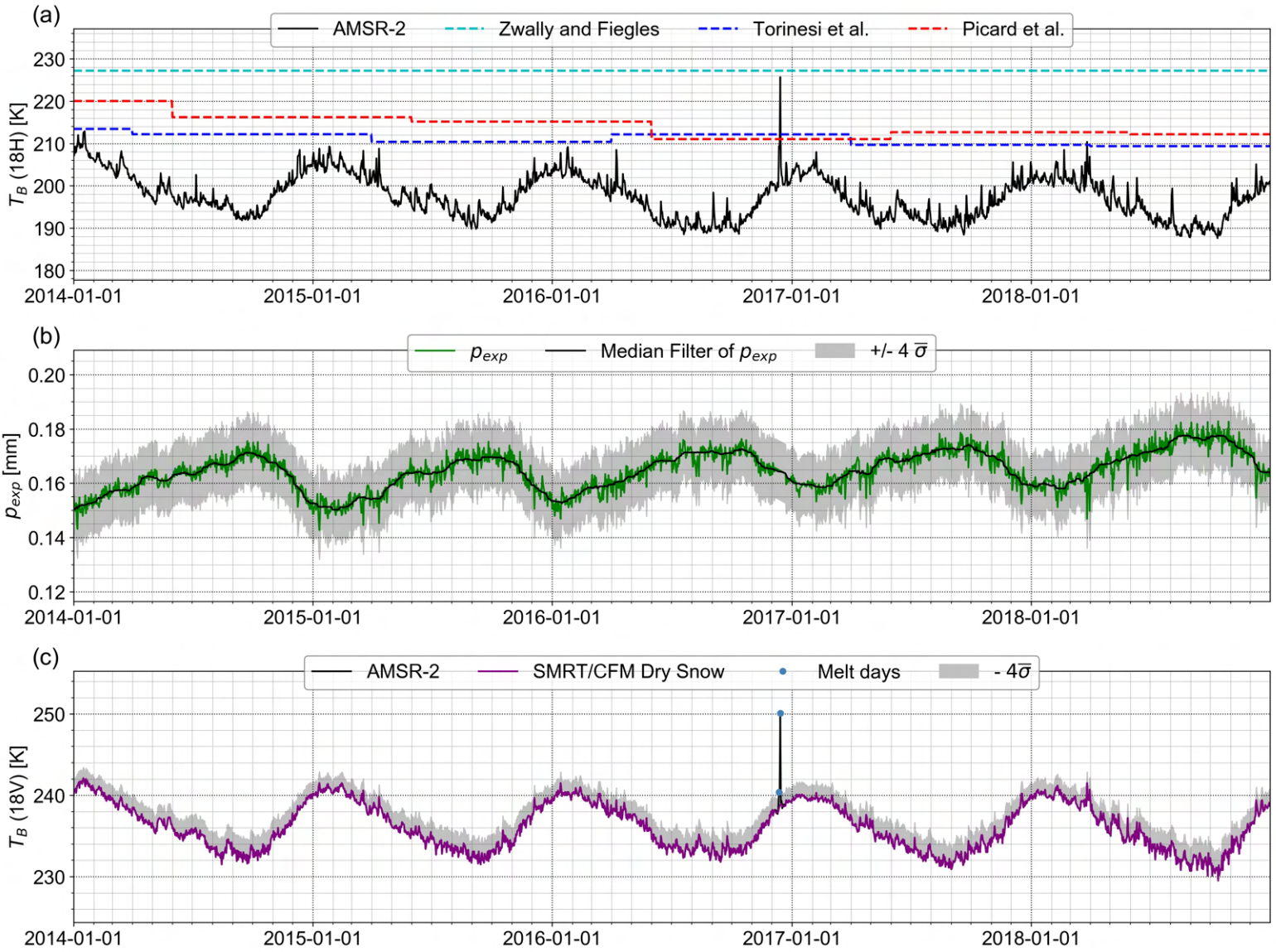
Site: AWS 11, Channel: 18V



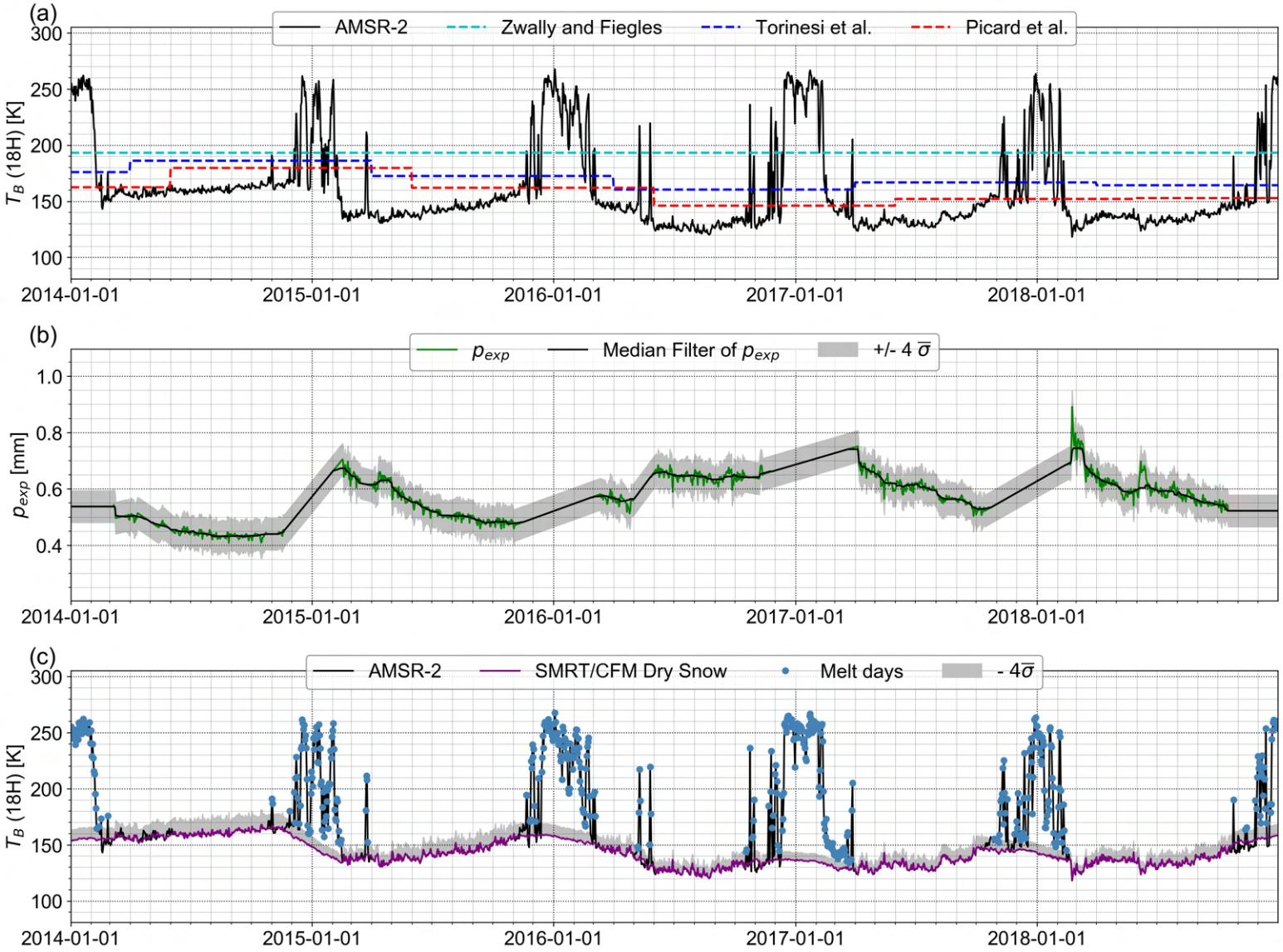
Site: AWS 6, Channel: 18H



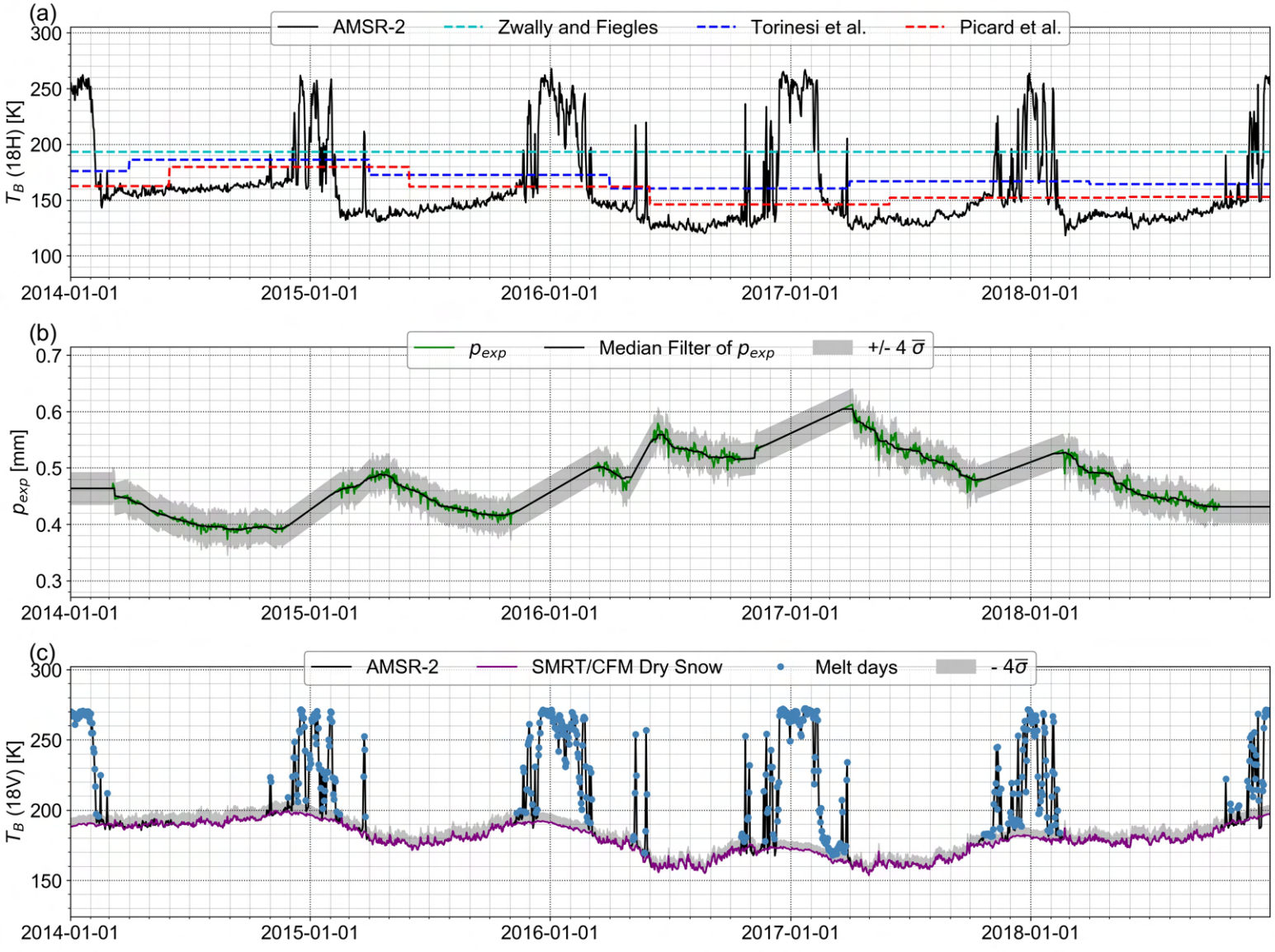
Site: AWS 6, Channel: 18V



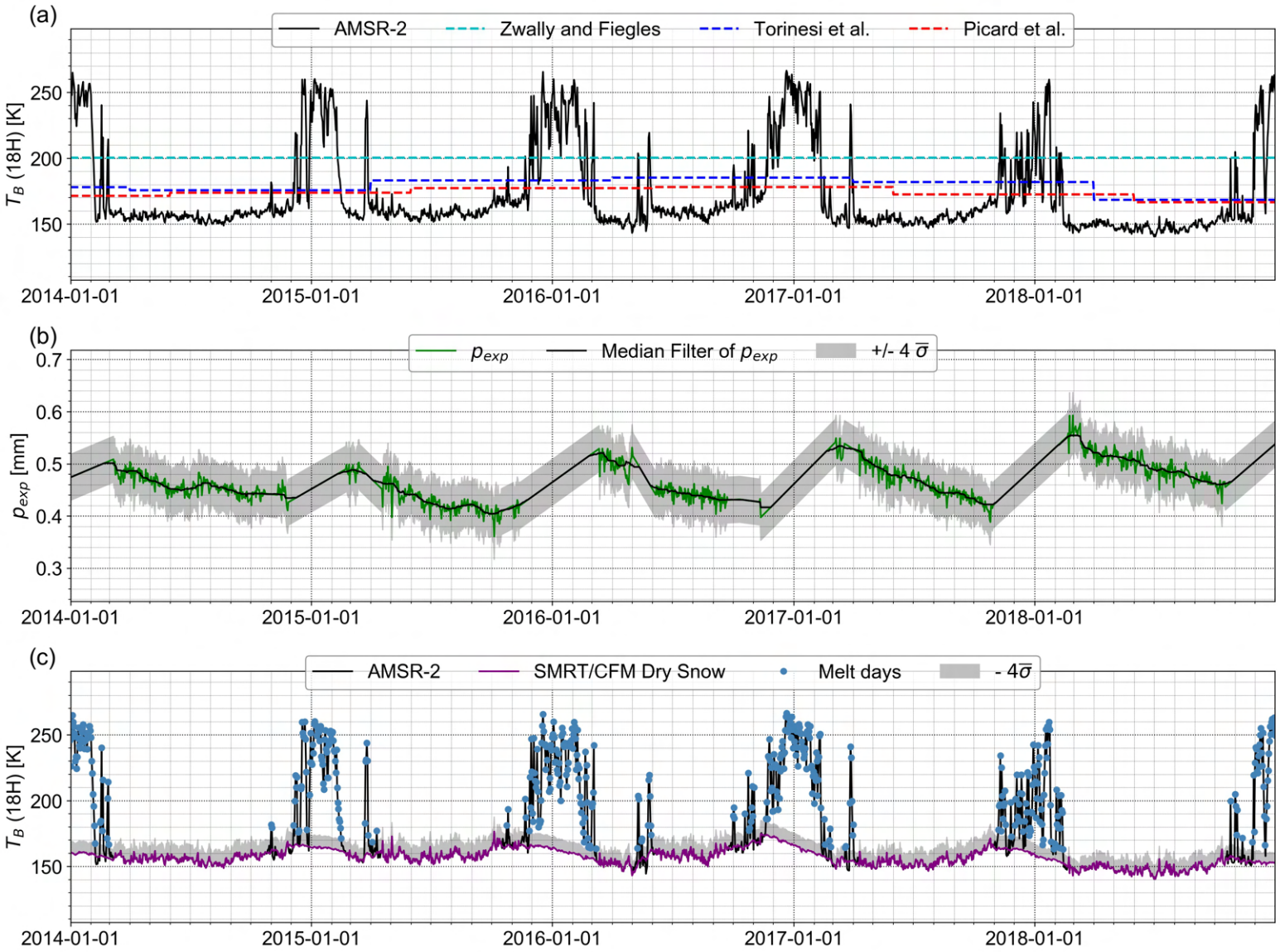
Site: AWS 14, Channel: 18H



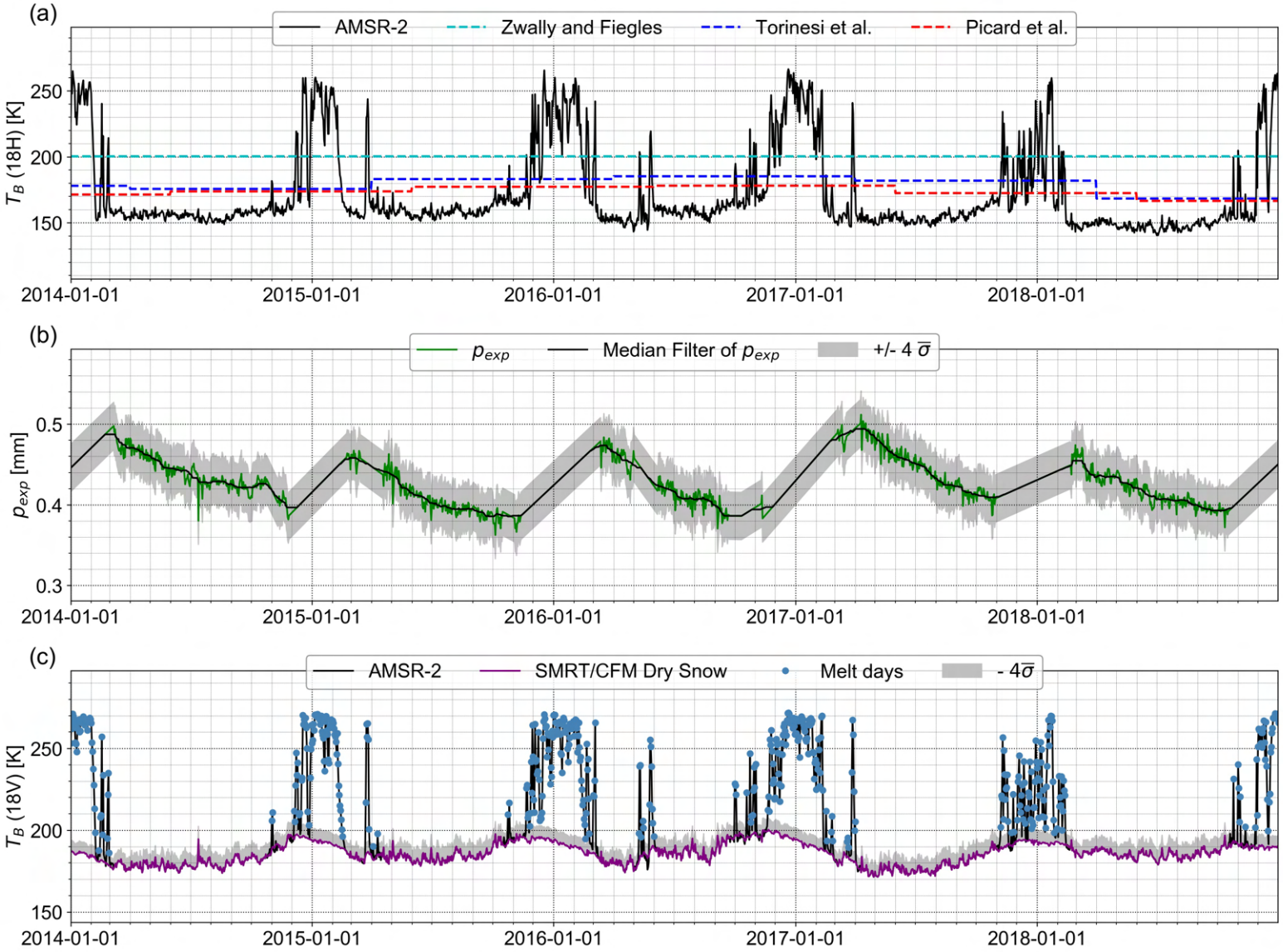
Site: AWS 14, Channel: 18V



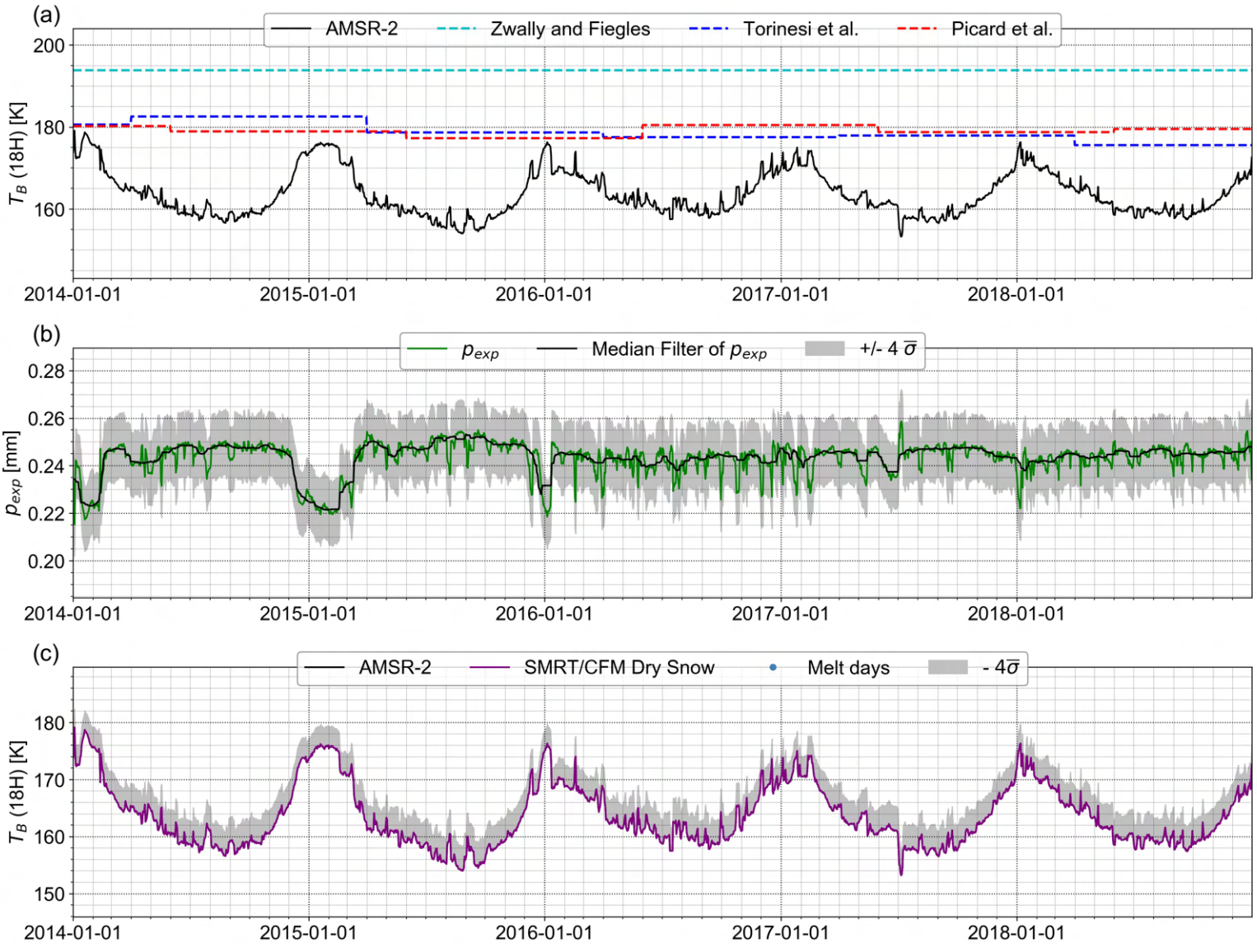
Site: AWS 17, Channel: 18H



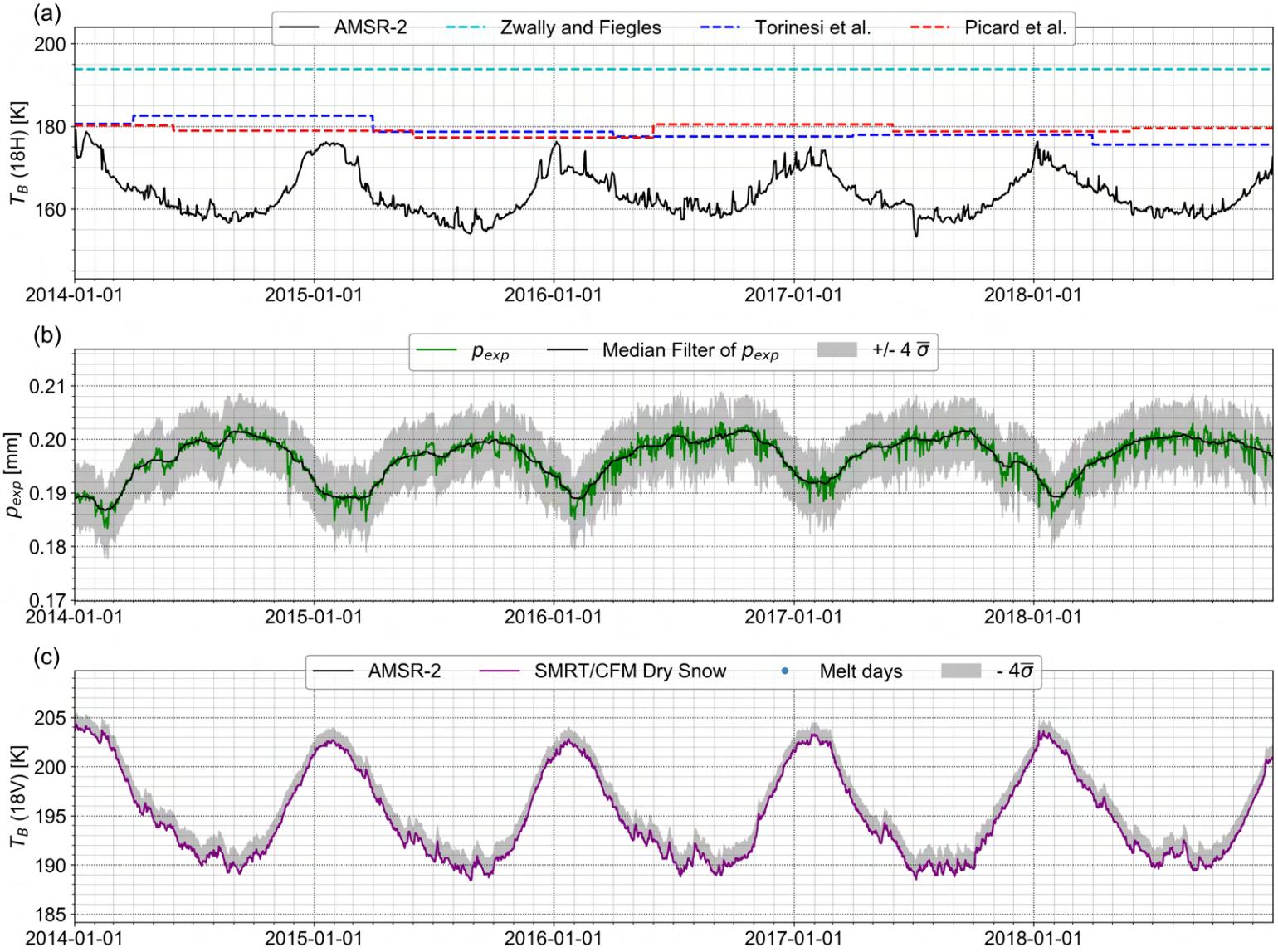
Site: AWS 17, Channel: 18V



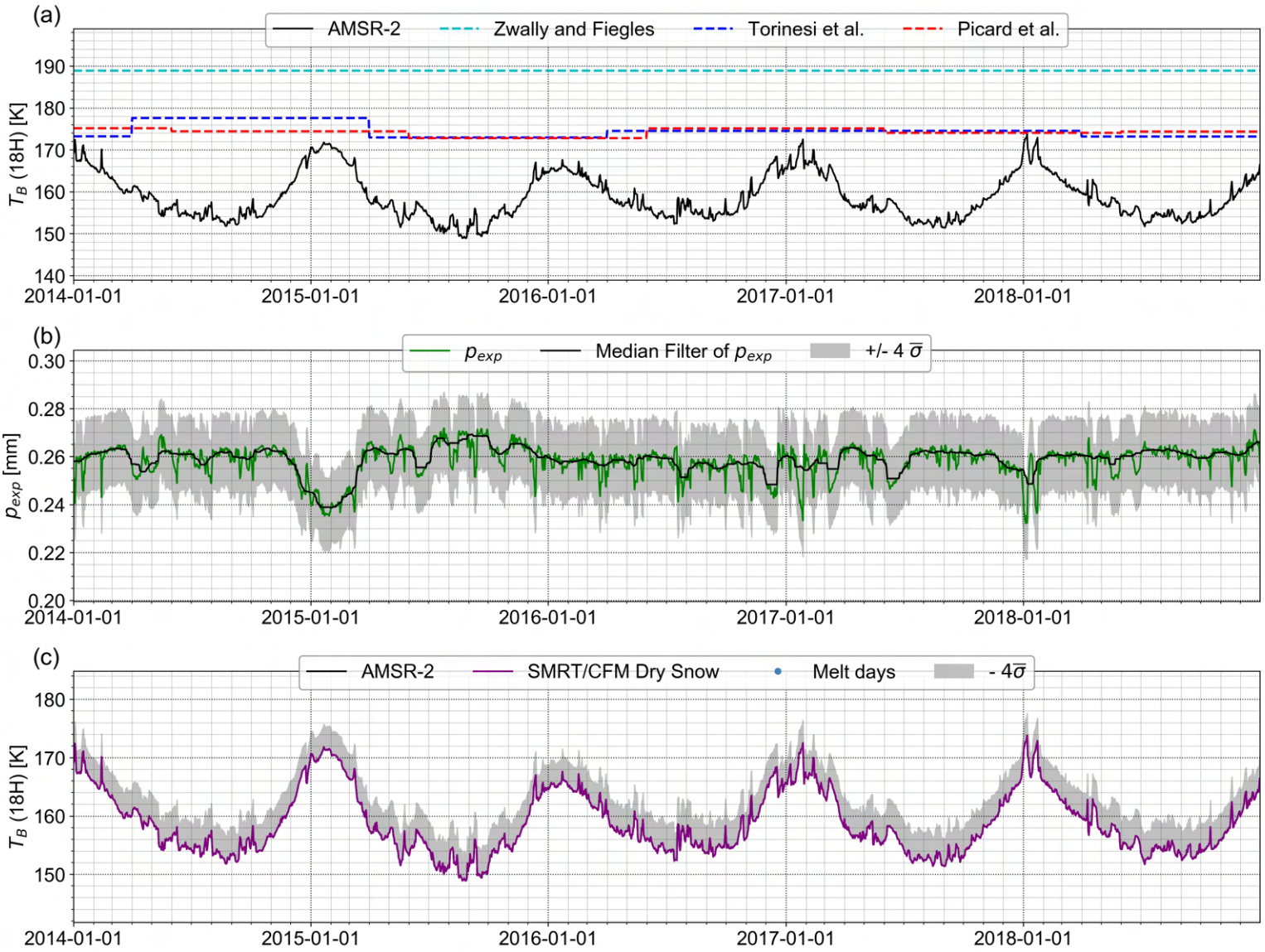
Site: Dome C, Channel: 18H



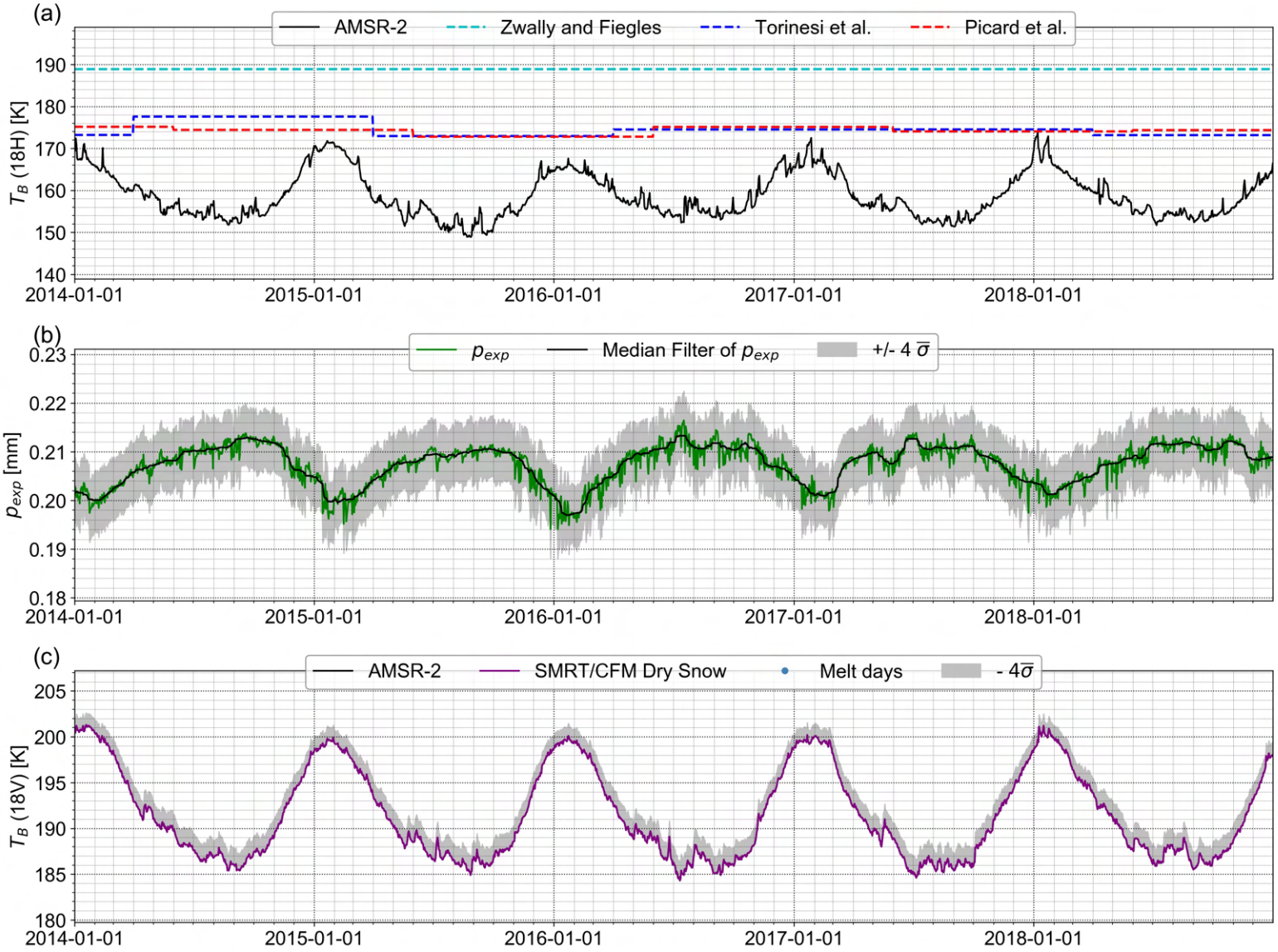
Site: Dome C, Channel: 18V



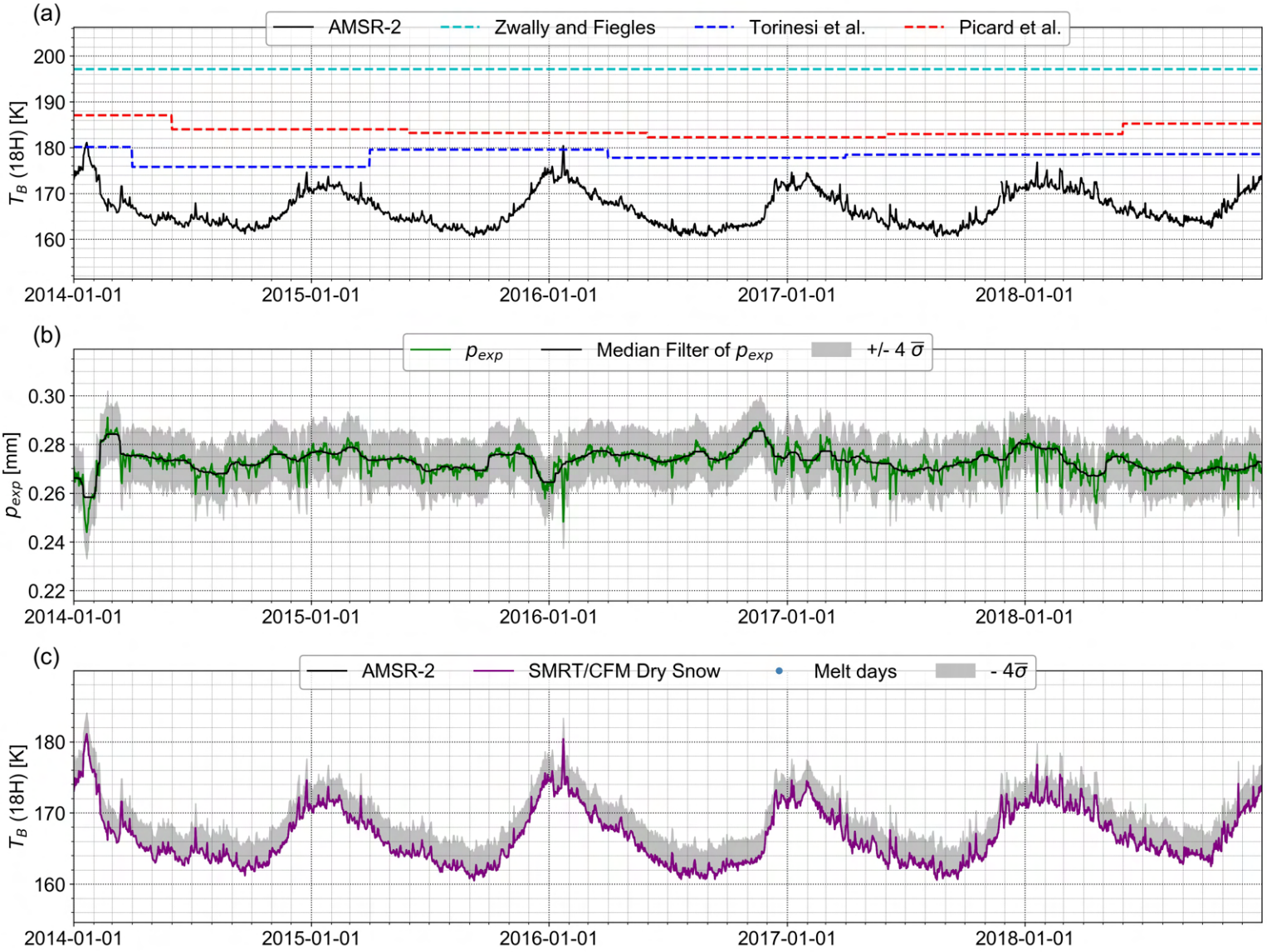
Site: Point Barnola, Channel: 18H



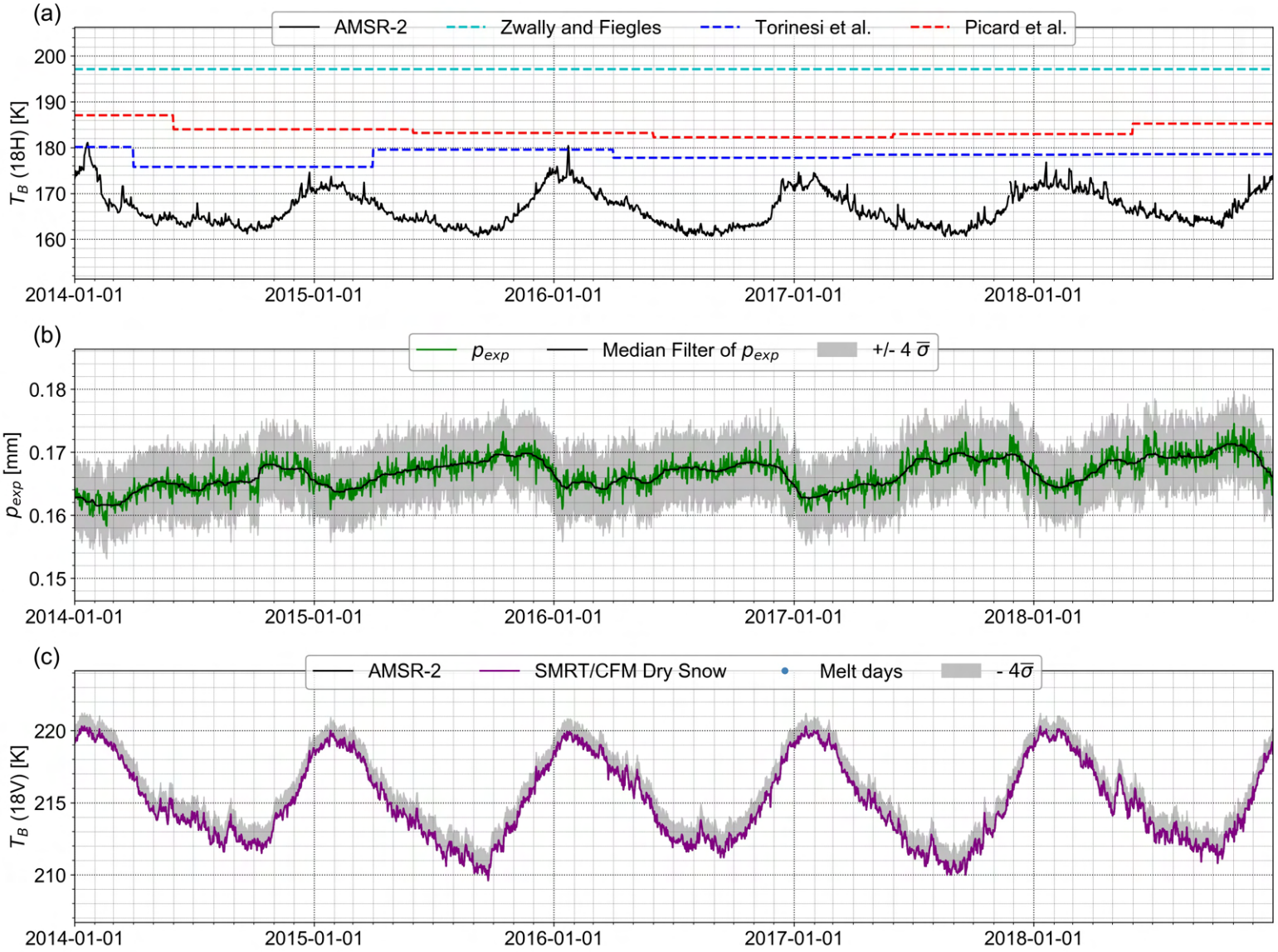
Site: Point Barnola, Channel: 18V



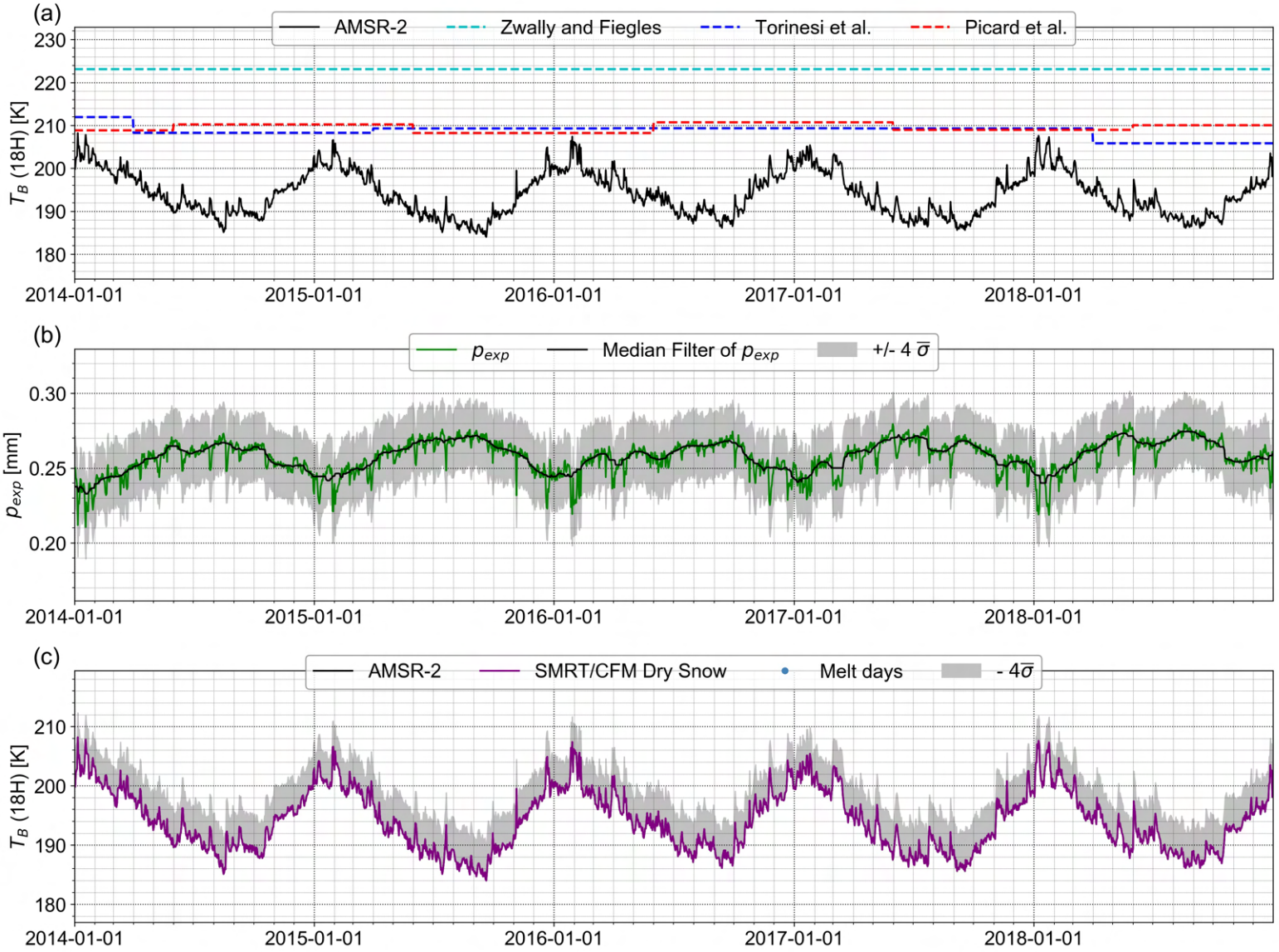
Site: Kohnen, Channel: 18H



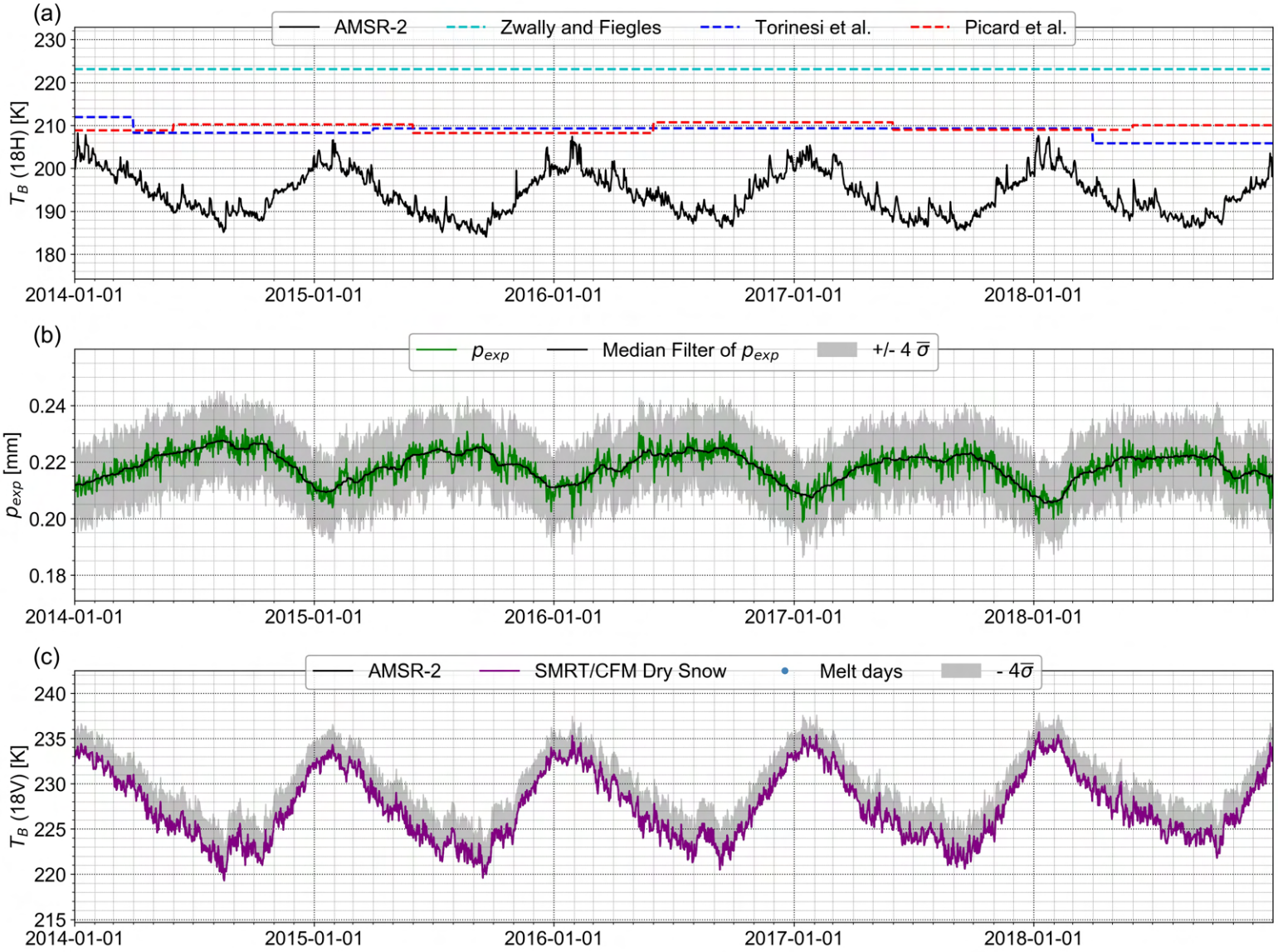
Site: Kohnen, Channel: 18V

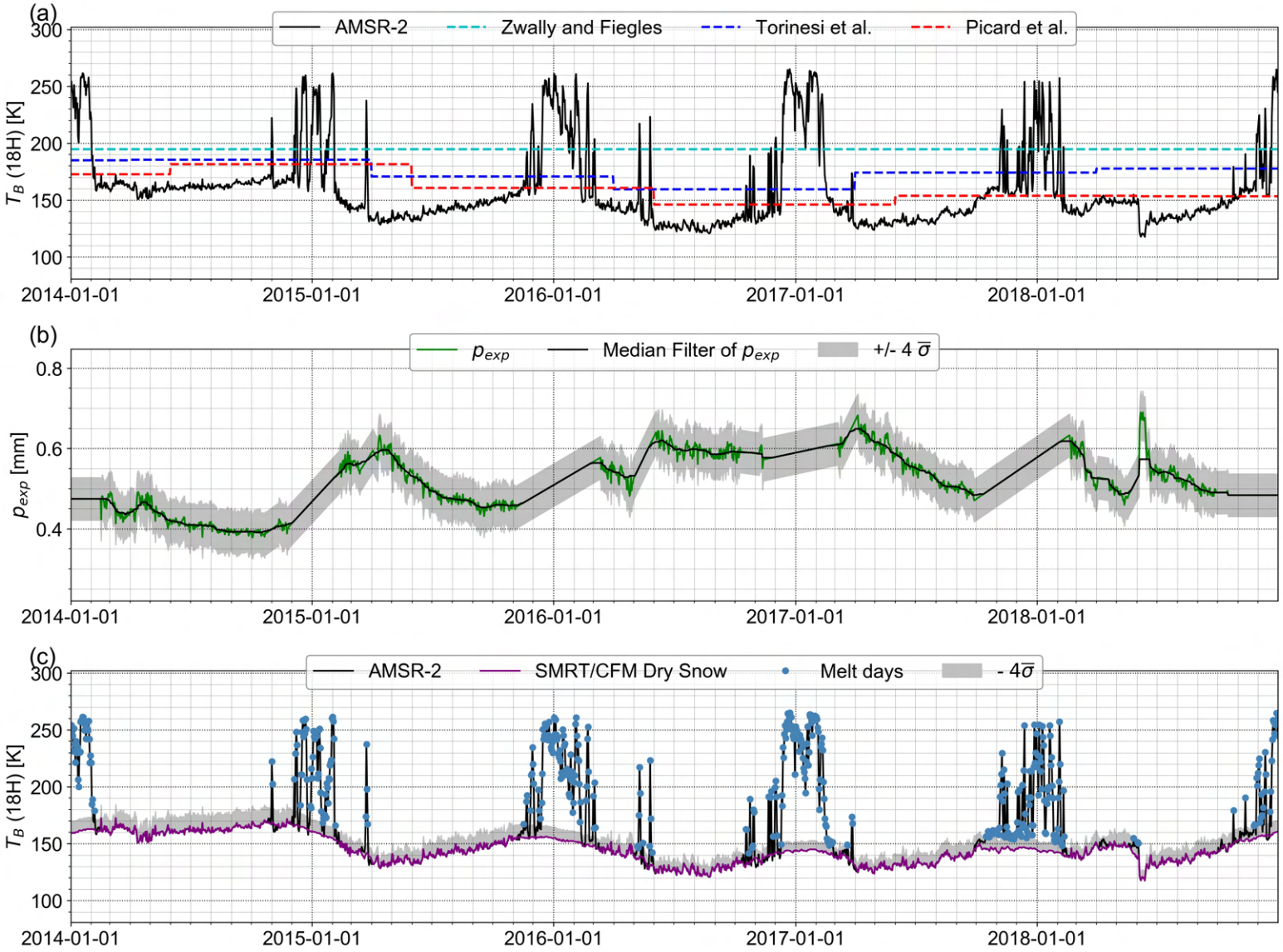


Site: AWS 16, Channel: 18H

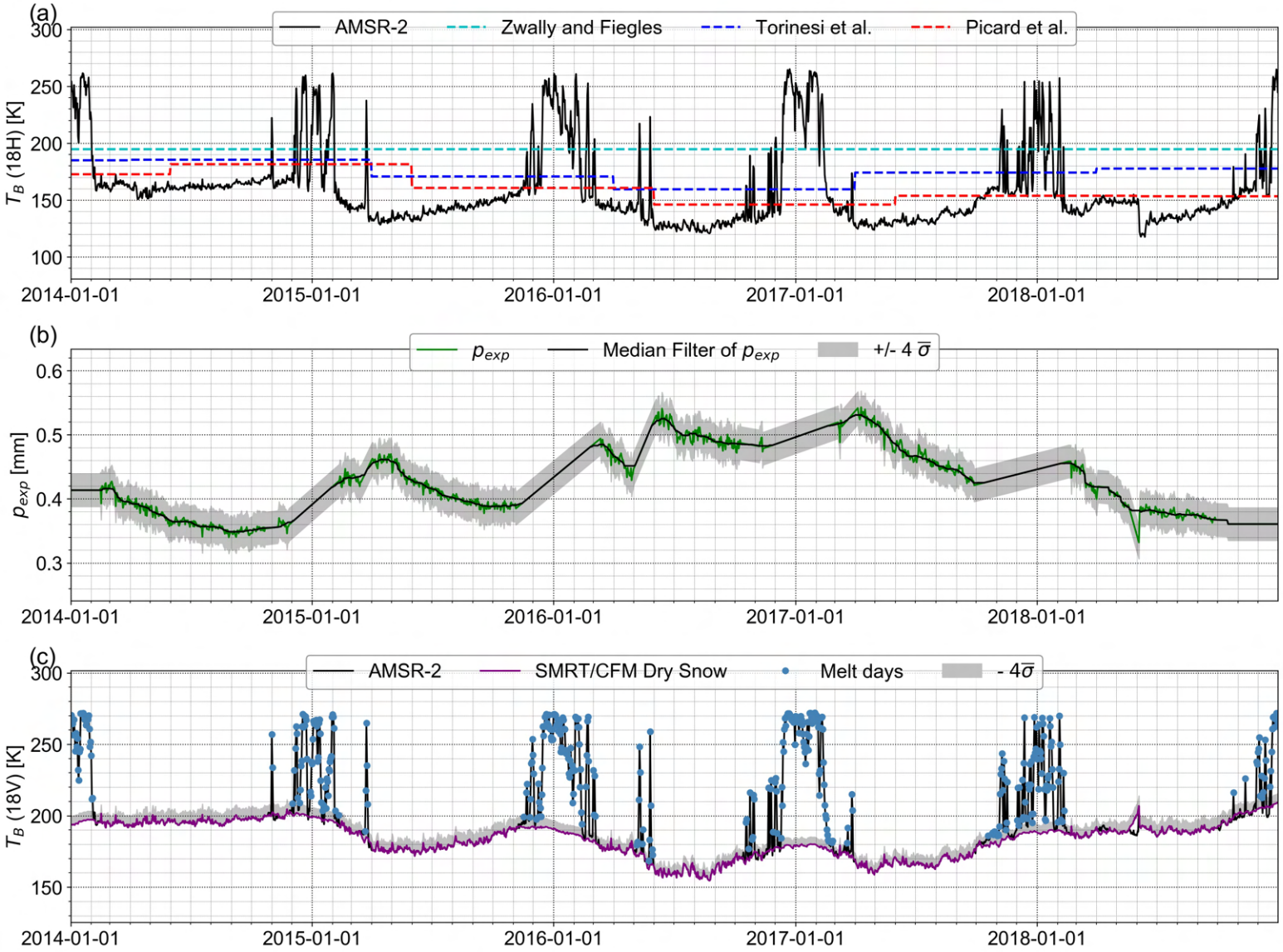


Site: AWS 16, Channel: 18V

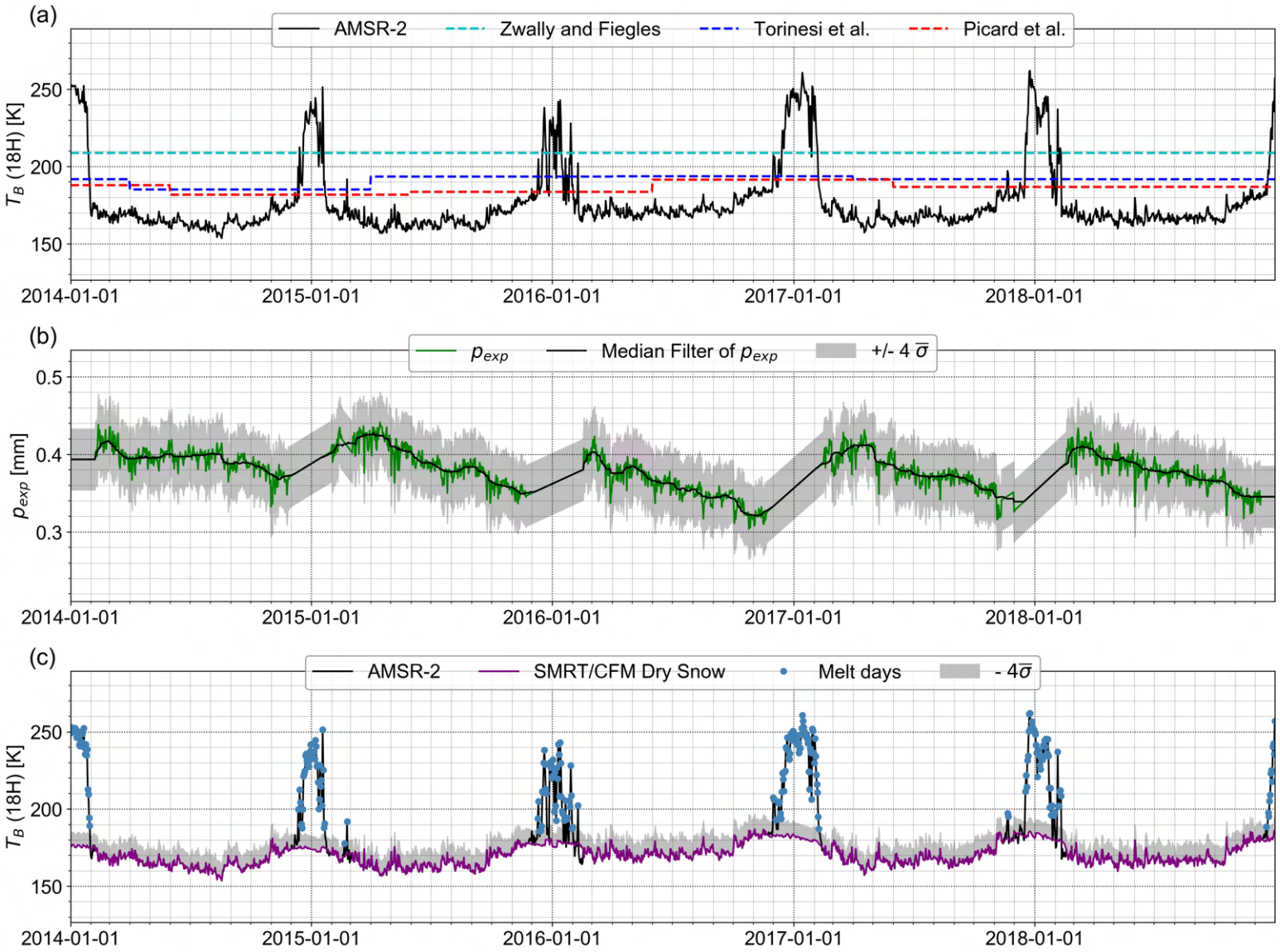



Site: AWS 15, Channel: 18H
(a)
AMSR-2
Zwally and Fiegles
Torinesi et al.
Picard et al.
T_B (18H) [K]
300
250
200
150
100
2014-01-01
2015-01-01
2016-01-01
2017-01-01
2018-01-01
(b)
p_{exp}
Median Filter of p_{exp}
+/- 4 $\overline{\sigma}$
p_{exp} [mm]
0.8
0.6
0.4
2014-01-01
2015-01-01
2016-01-01
2017-01-01
2018-01-01
(c)
AMSR-2
SMRT/CFM Dry Snow
Melt days
- 4$\overline{\sigma}$
T_B (18H) [K]
300
250
200
150
100
2014-01-01
2015-01-01
2016-01-01
2017-01-01
2018-01-01

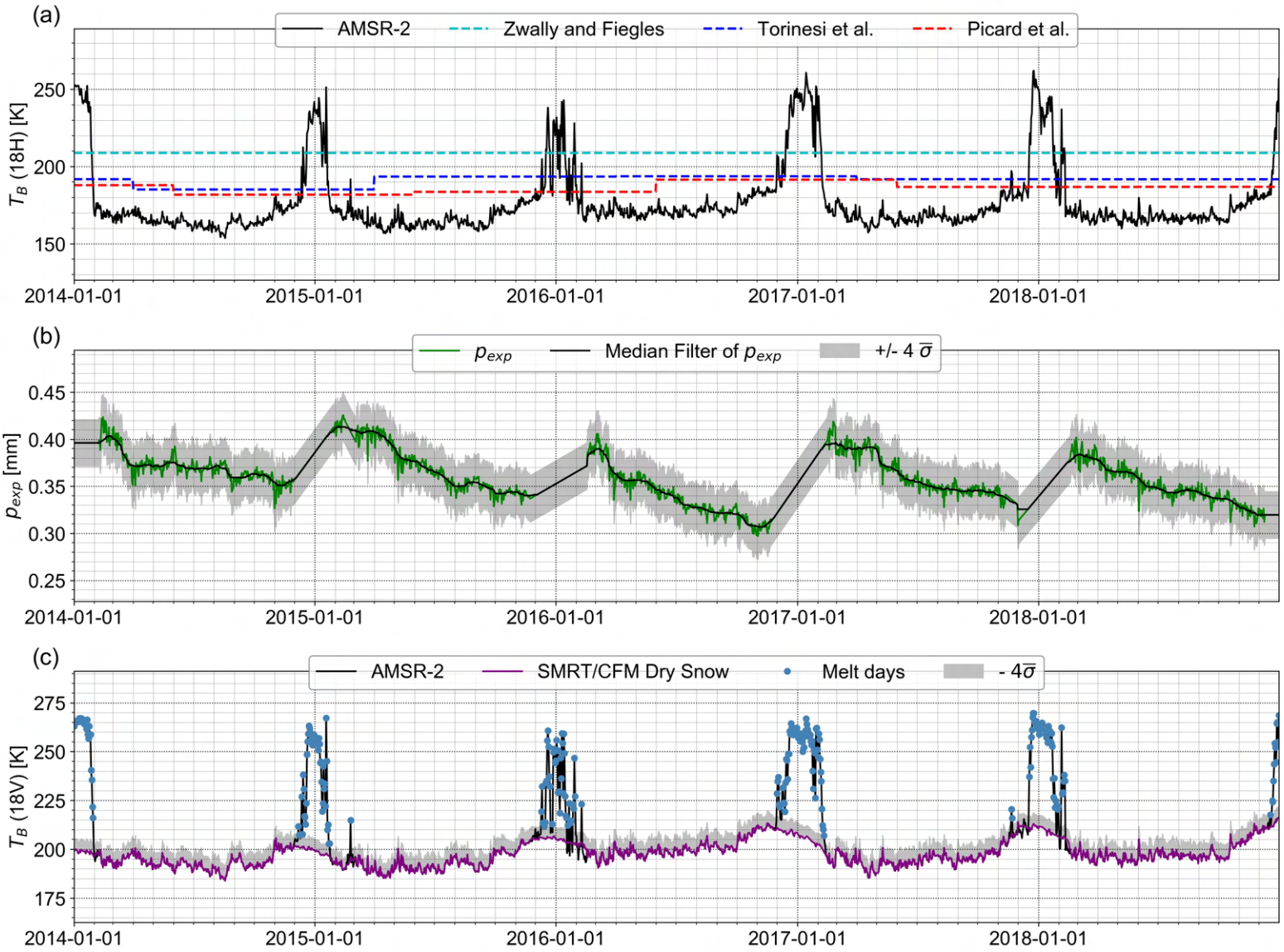
Site: AWS 15, Channel: 18V



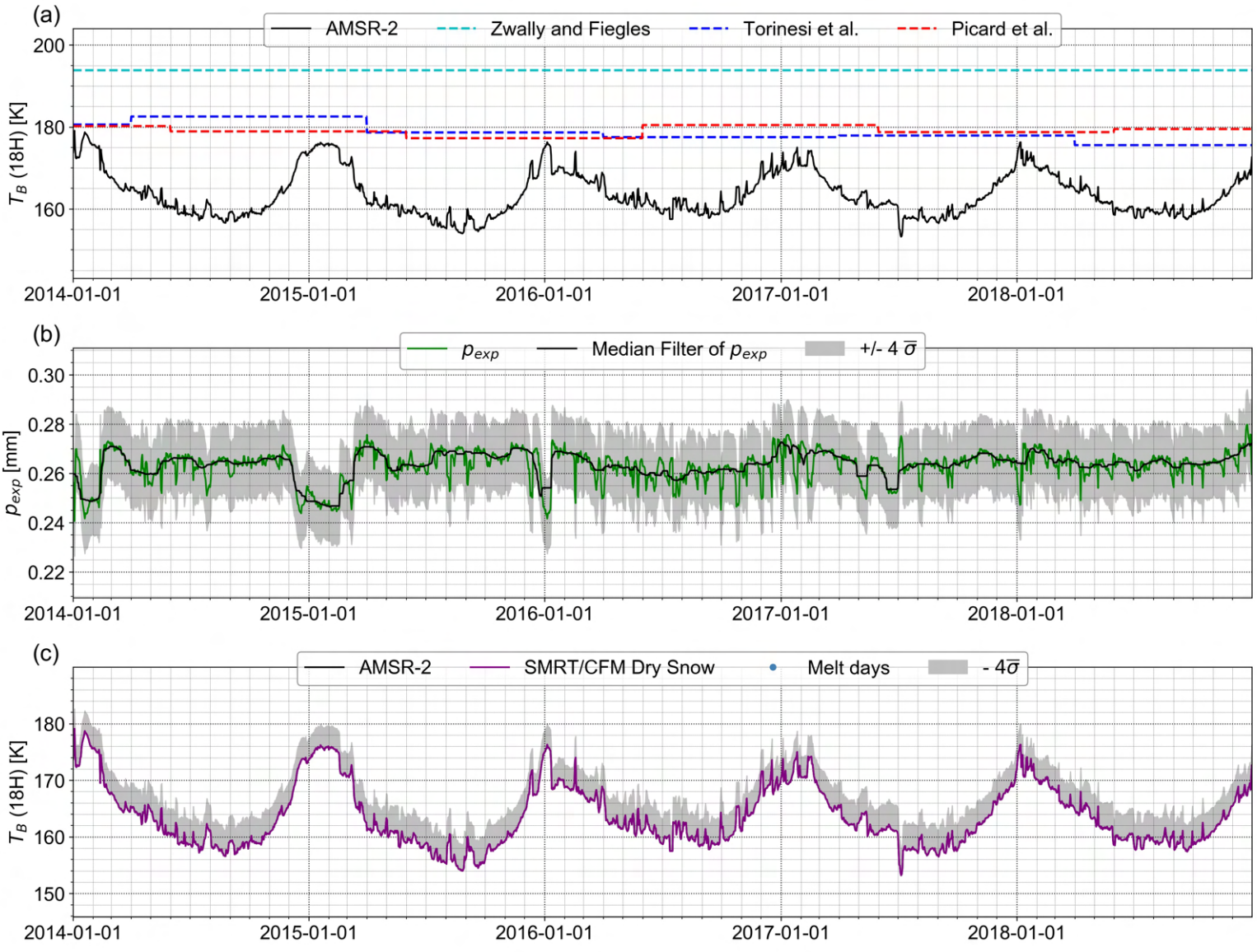
Site: AWS 19, Channel: 18H



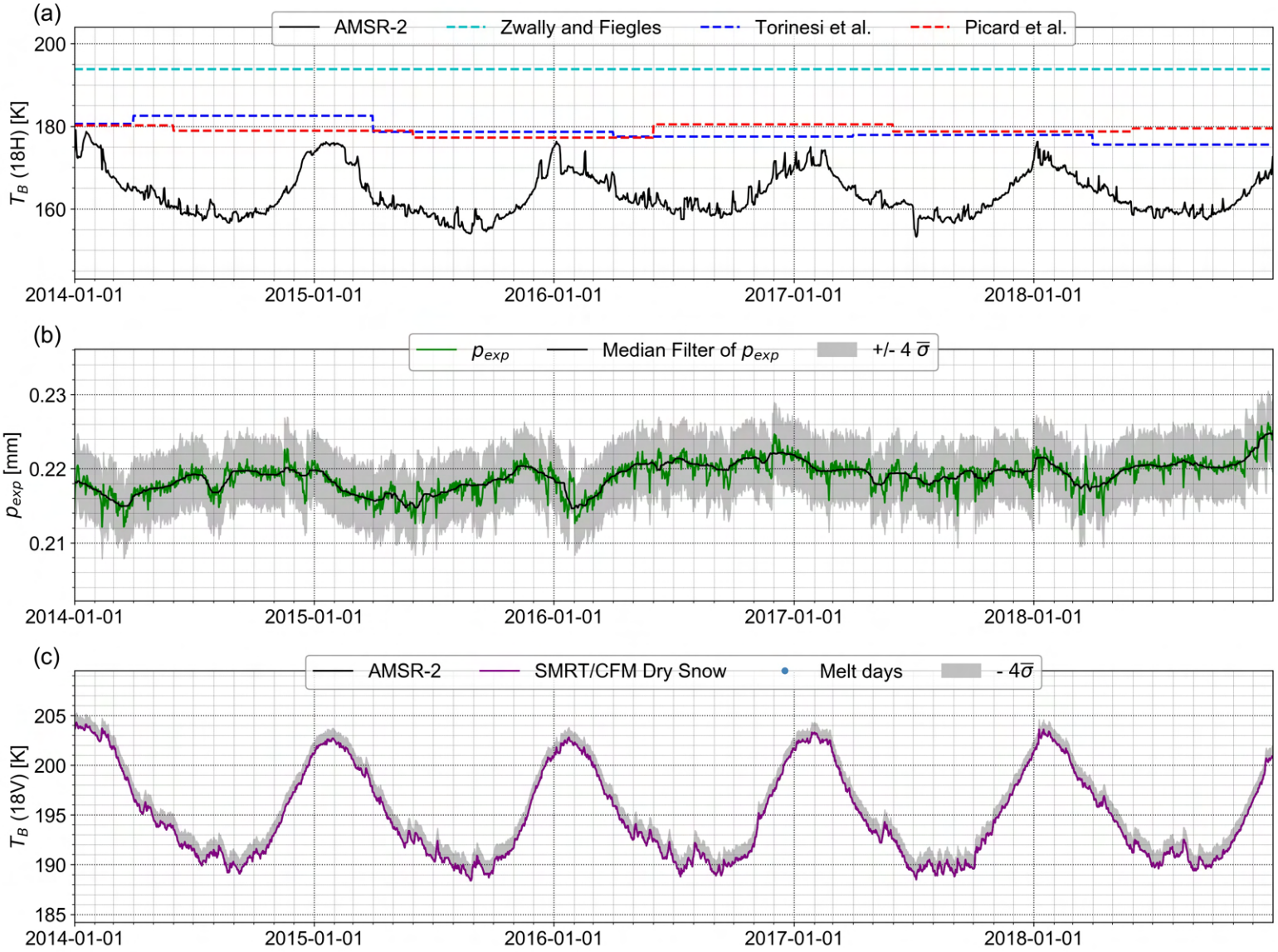
Site: AWS 19, Channel: 18V



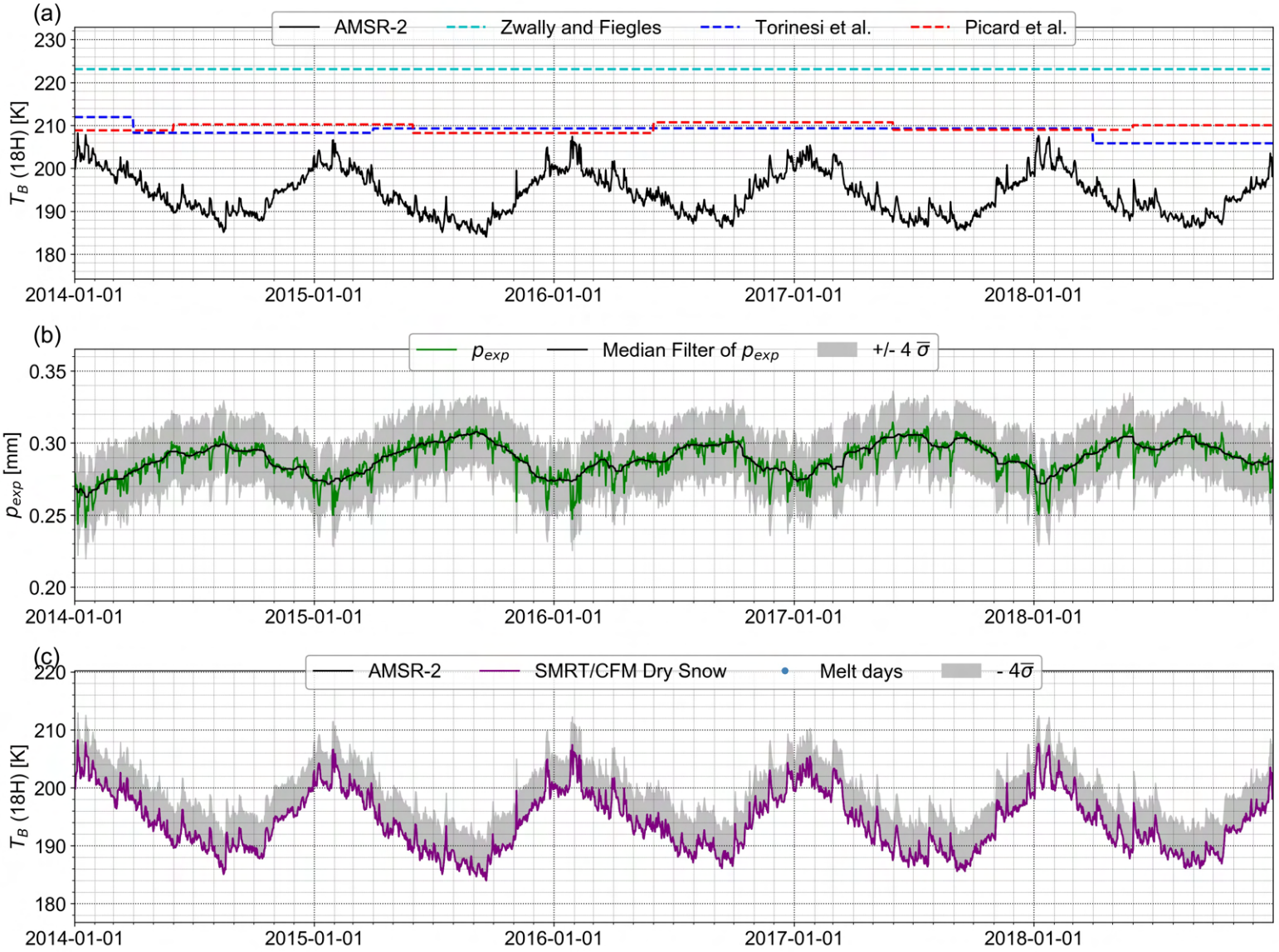
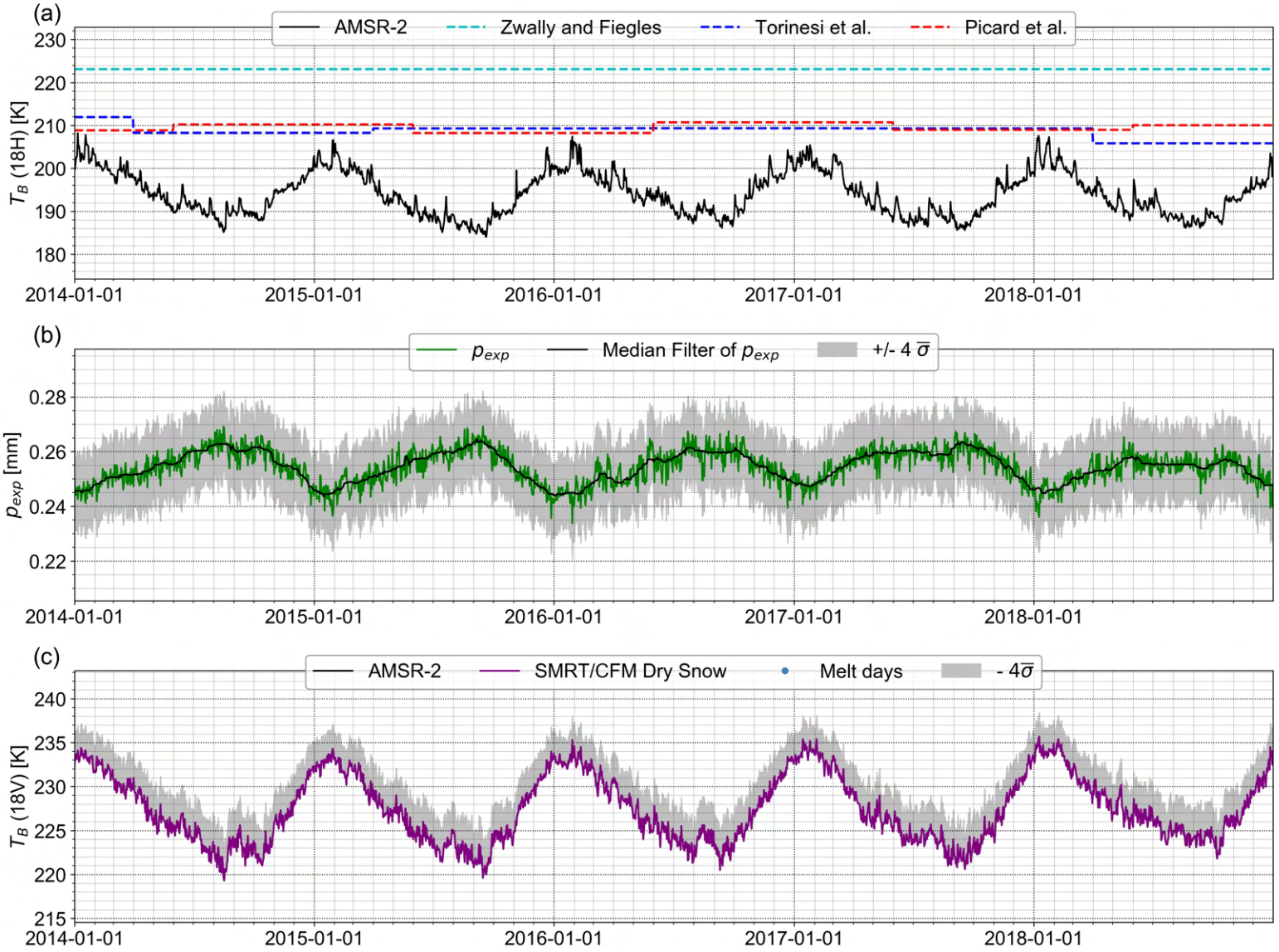
Site: Dome C (Bias Corrected), Channel: 18H



Site: Dome C (Bias Corrected), Channel: 18V



Site: AWS16 (Bias Corrected), Channel: 18H



Site: AWS16 (Bias Corrected), Channel: 18V