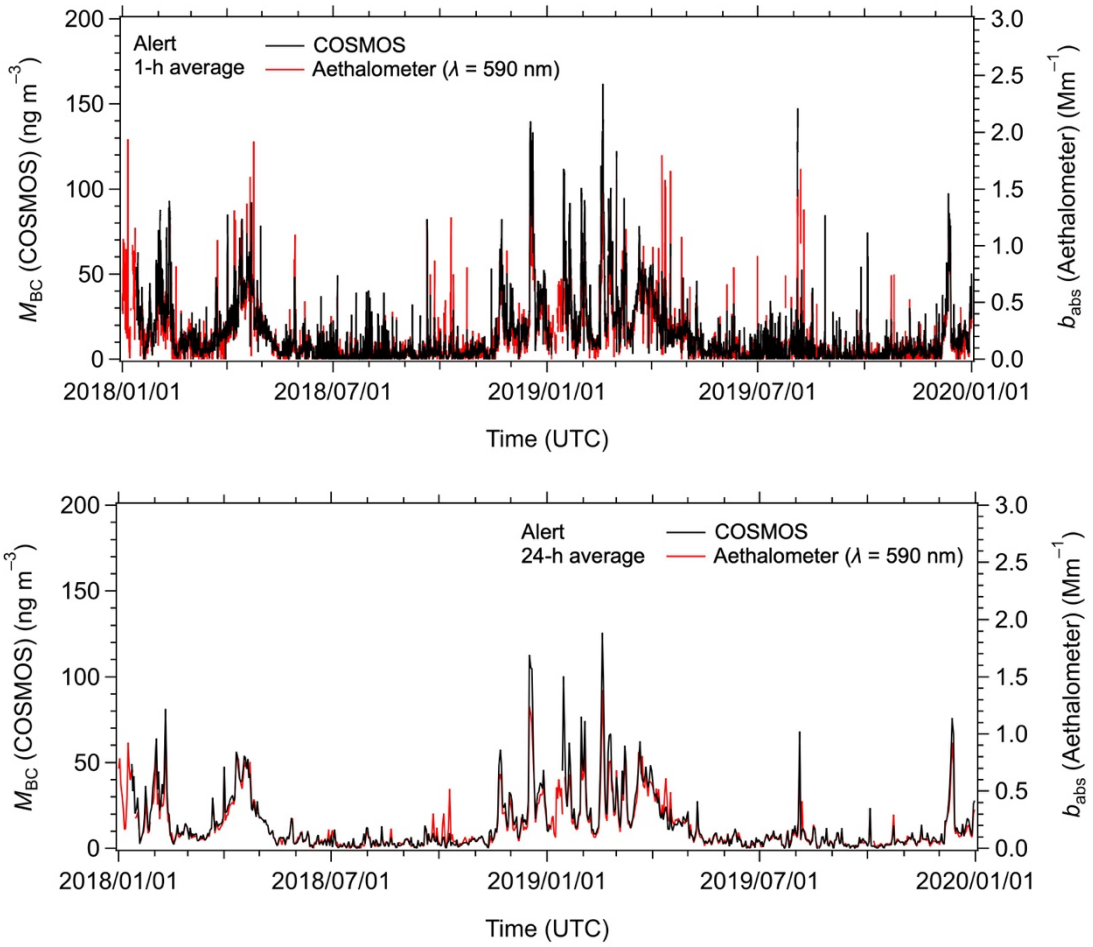


Figure S1. Time series of 1-h and 24-h averaged M_{BC} (COSMOS) and b_{abs} (Aethalometer; λ= 590 nm) from January 2018 to December 2019 at Alert.

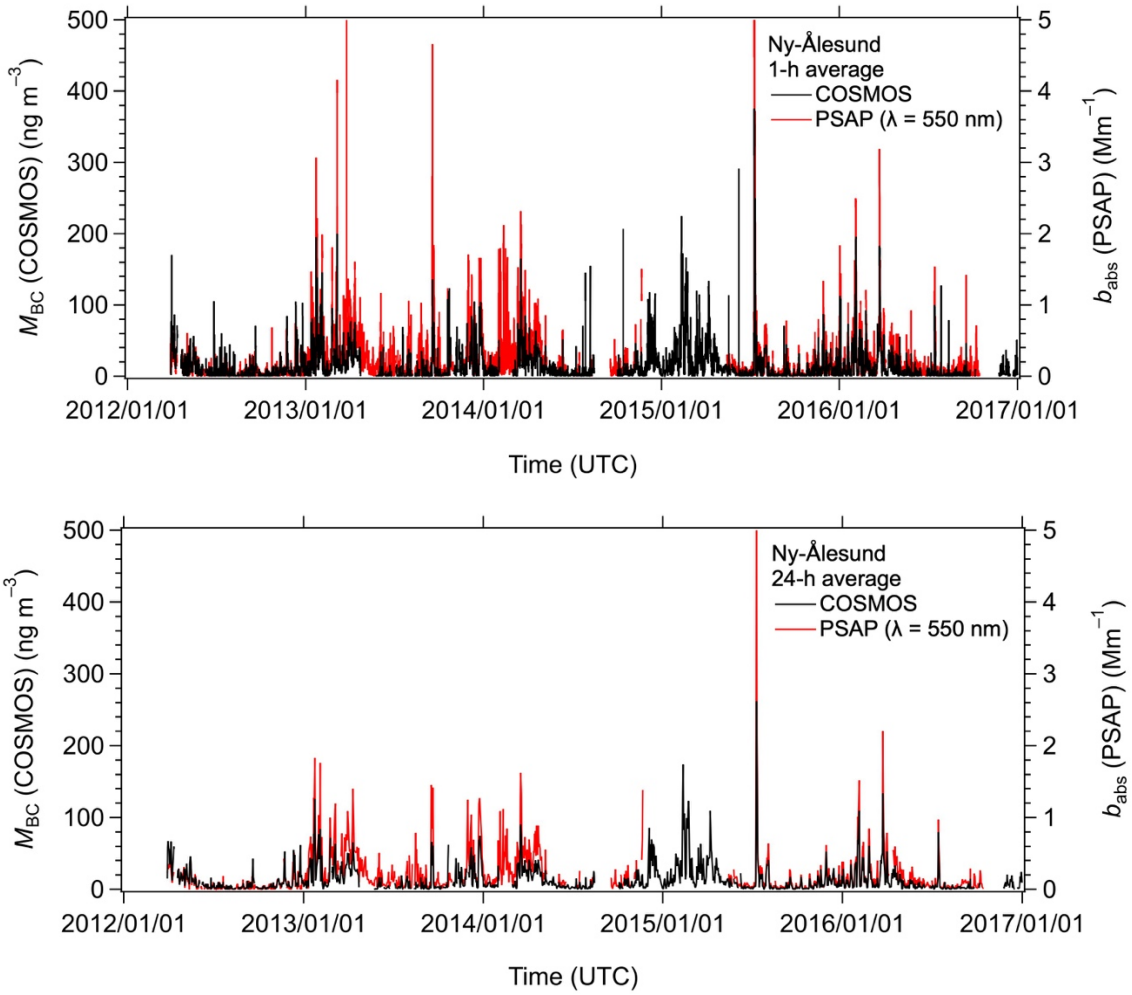
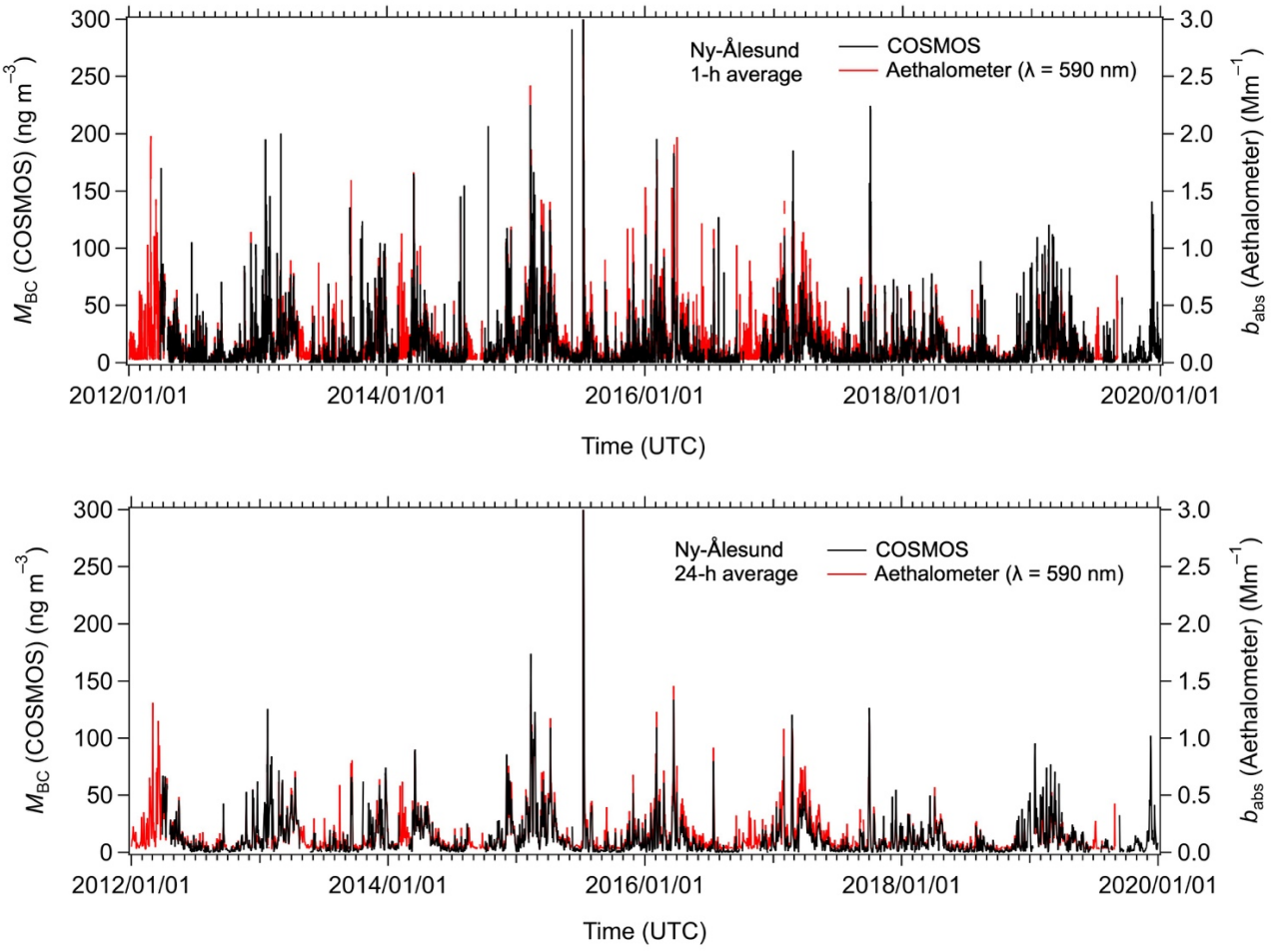


Figure S2. Time series of 1-h and 24-h averaged M_{BC} (COSMOS) and b_{abs} (PSAP; λ= 550 nm) from April 2012 to September 2016 at Ny-Ålesund.



15 **Figure S3.** Time series of 1-h and 24-h averaged M_{BC} (COSMOS) and b_{abs} (Aethalometer; λ= 590 nm) from April 2012 to August 2019 at Ny-Ålesund.

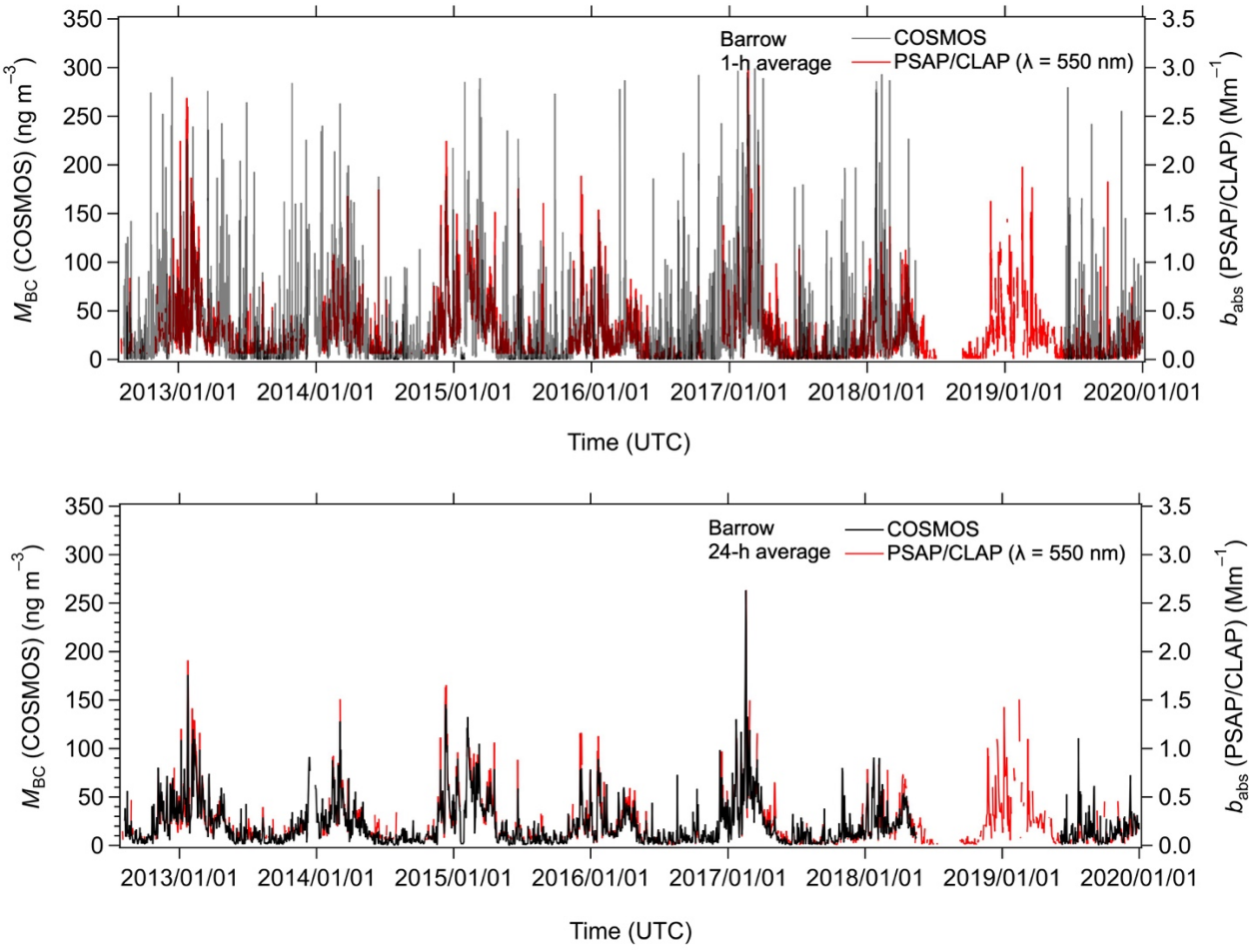


Figure S4. Time series of 1-h and 24-h averaged M_{BC} (COSMOS) and b_{abs} (PSAP/CLAP; λ= 550 nm) from August 2012 to December 2019 at Barrow.

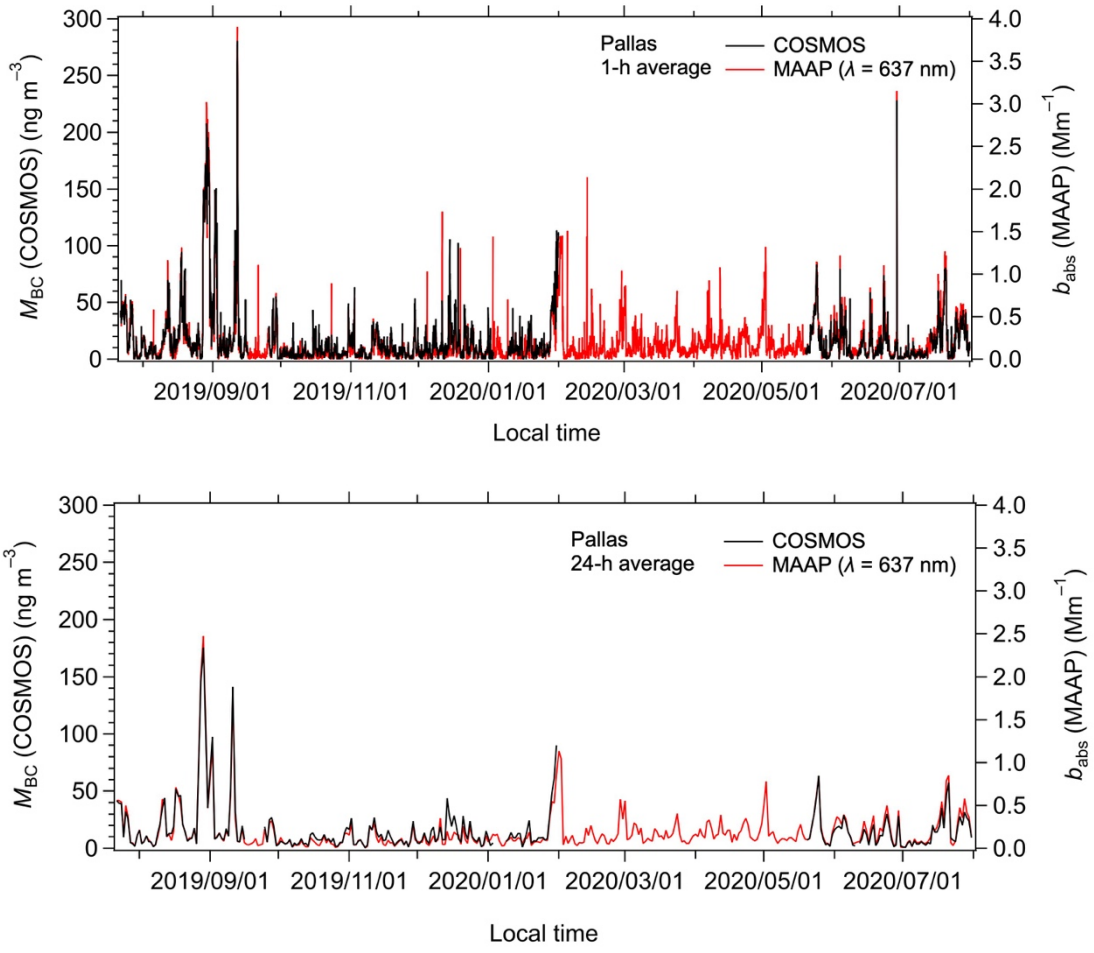


Figure S5. Time series of 1-h and 24-h averaged M_{BC} (COSMOS) and b_{abs} (MAAP; λ= 637 nm) from July 2019 to July 2020 at Pallas.

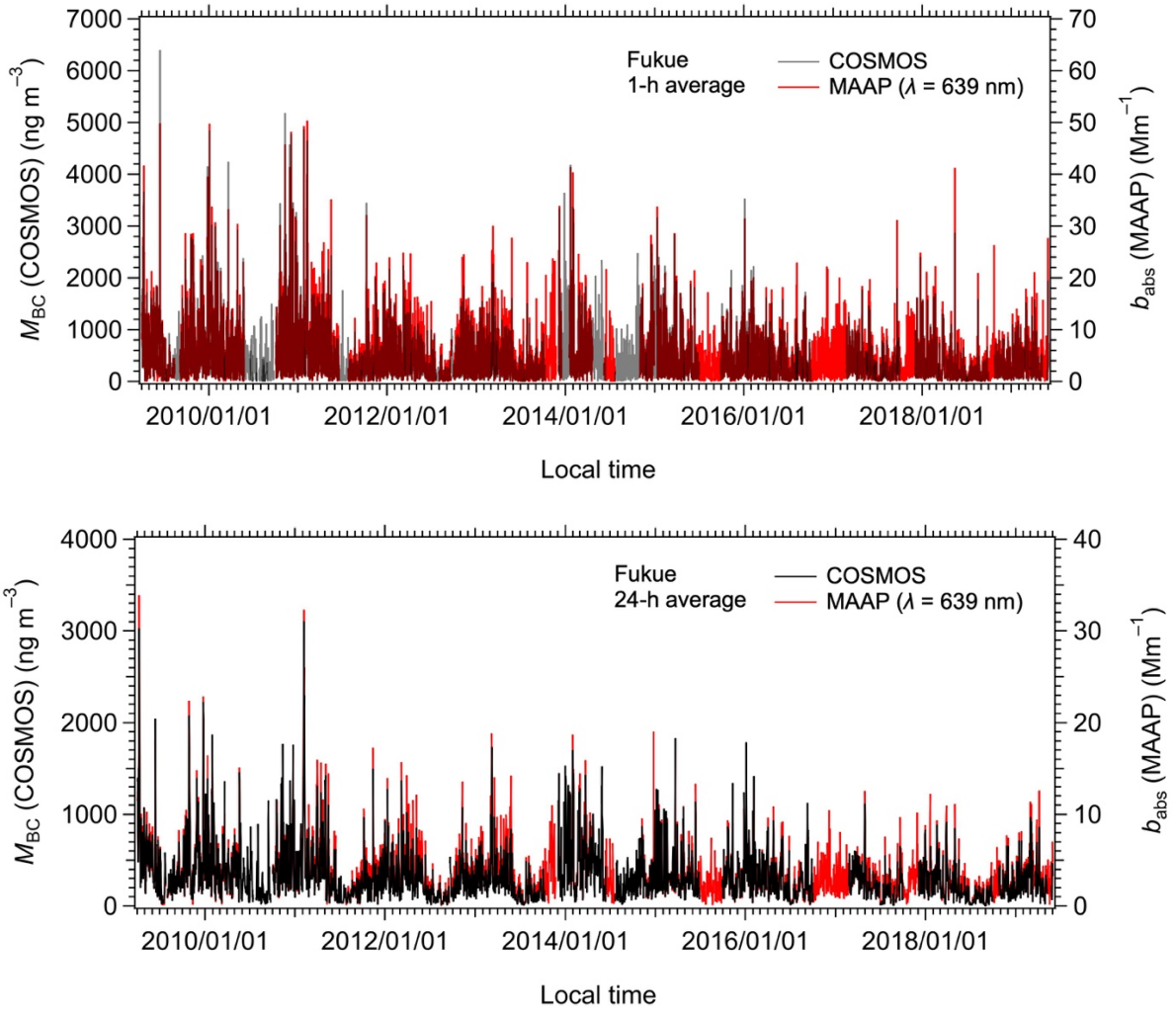


Figure S6. Time series of 1-h and 24-h averaged M_{BC} (COSMOS) and b_{abs} (MAAP; λ= 639 nm) from April 2009 to May 2019 at Fukue.