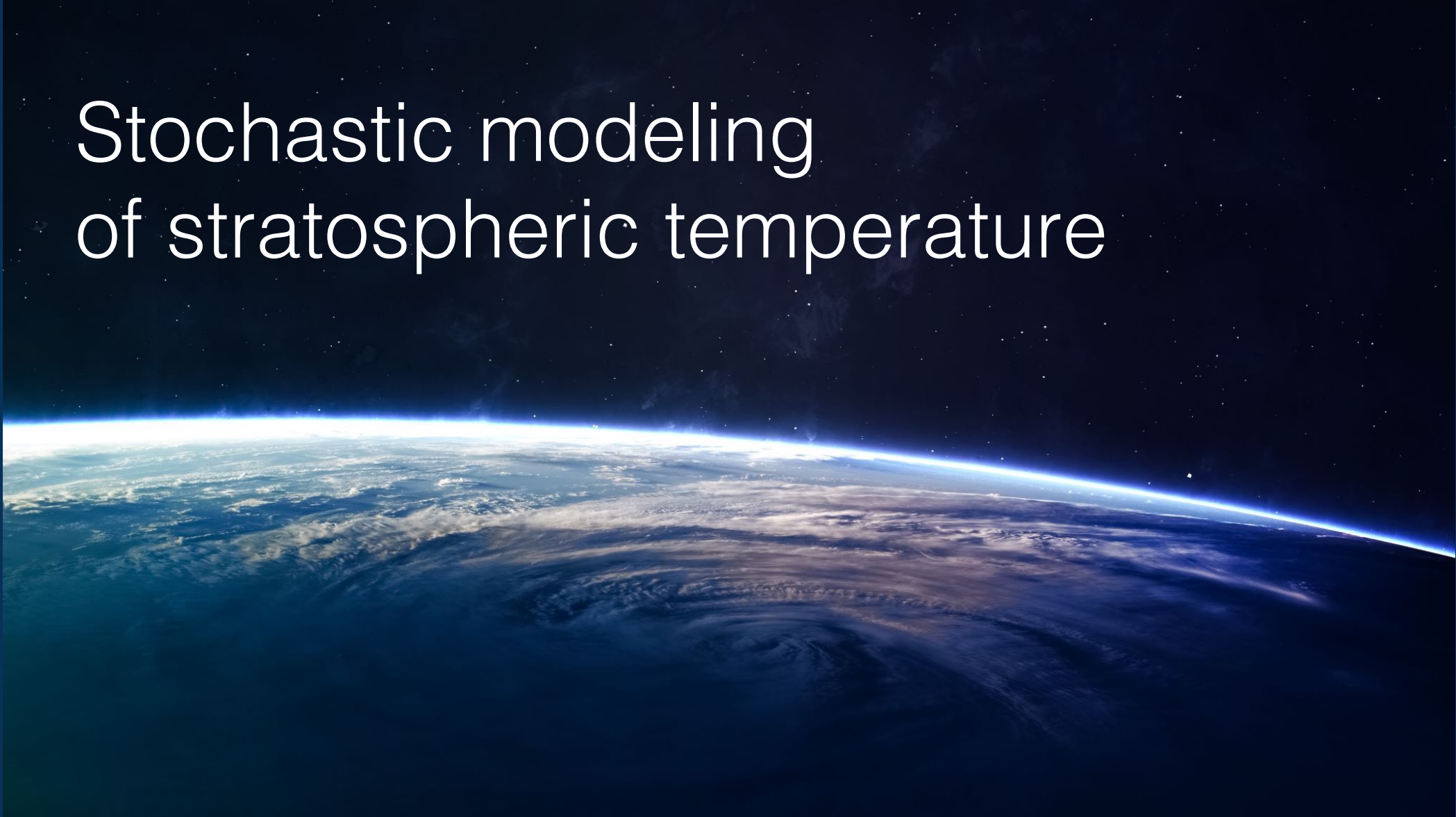


Stochastic modeling of stratospheric temperature



Peer-reviewed paper: Eggen, Mari Dahl; Dahl, Kristina Rognlien; Näsholm, Sven Peter & Mæland, Steffen (2022). Stochastic Modeling of Stratospheric Temperature. Mathematical Geosciences. ISSN 1874-8961. <https://doi.org/10.1007/s11004-021-09990-6>.





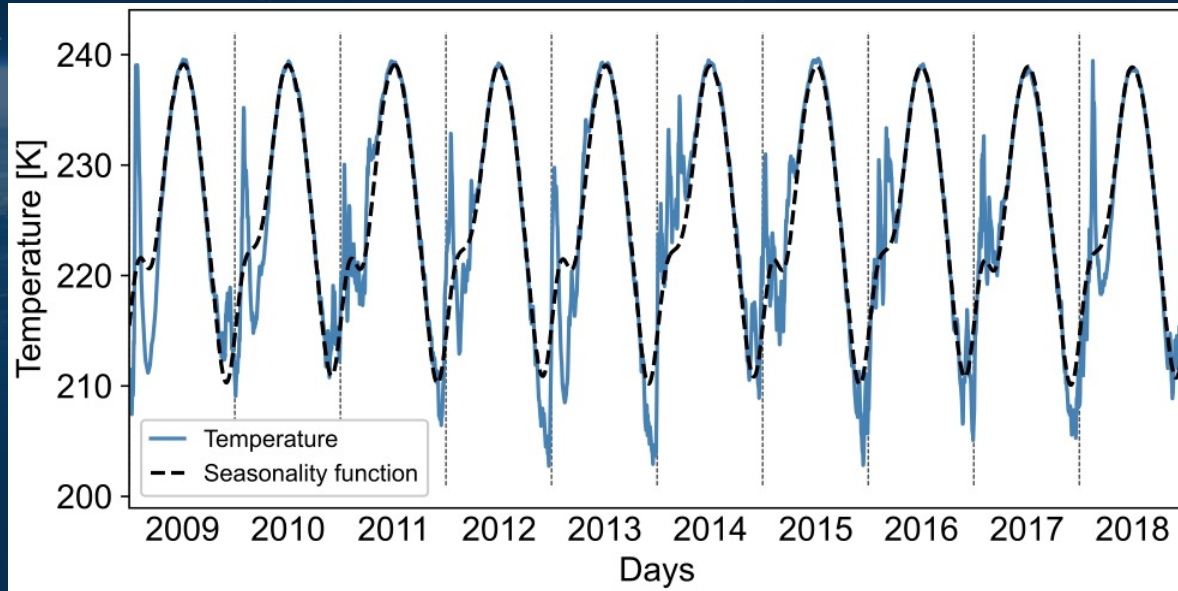
1. Why do we want to probe the stratosphere using stochastic modeling?

- Challenging to obtain continuous measurements
- Use information from infrasound measurements
- Stratosphere-troposphere coupling



2. How to model stratospheric temperature?

Temperature = Seasonality function + Autoregressive behaviour



$$S(t) = \Lambda(t) + X_1(t)$$

$$d\hat{X}(t) = A\hat{X}(t)dt + \widehat{e}_p\sigma(t-)dL(t)$$

Daily zonal mean stratospheric temperature, $S(t)$, over 60°N from 1 January 2009 to 31 December 2018 with a fitted seasonality function, $\Lambda(t)$.



3. Going forward...

- Preprint: “The multivariate ARMA/CARMA transformation relation”
- Relate infrasound and stratospheric weather variable dynamics using multivariate CARMA model and ML methods