I have summarised the new version of the proposal below based on the discussion. Is there anything you'd like to change about it?

I have tried to base these directly on the numbered list in the original proposal, please let me know if I have made a mistake!

1. **Term:** remote\_sensing\_averaging\_kernel\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: kernel\_of mole\_fraction\_of\_methane\_in\_air

Description: Averaging kernels of the methane mole fractions obtained by a remote sensing observation (changes of methane in the retrieved atmosphere relative to the changes of methane in the true atmosphere, Rodgers 2000).

1. **Term:** remote\_sensing\_averaging\_kernel\_of\_logarithm\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: fractional\_kernel\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Logarithmic scale averaging kernels of the methane mole fractions obtained by a remote sensing observation (Rodgers, 2020). These kernels are also called fractional averaging kernels (Keppens et al., 2015) They represent the fractional changes of methane in the retrieved atmosphere relative to the fractional changes of methane in the true atmosphere.

1. **Term:** rank\_of\_remote\_sensing\_averaging\_kernel\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: kernel\_rank\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Rank the matrix representing the remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (changes of methane in the retrieved atmosphere relative to the changes of methane in the true atmosphere, Rodgers 2000).

1. **Term:** left\_singular\_vector of\_remote\_sensing\_averaging\_kernel\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: kernel\_left\_vector\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Left singular vectors of the matrix representing the remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (changes of methane in the retrieved atmosphere relative to the changes of methane in the true atmosphere, Rodgers 2000).

1. **Term:** singular\_value\_of\_remote\_sensing\_averaging\_kernel\_mole\_fraction\_of\_methane\_in\_air
Original term: kernel\_singular\_values\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Singular values of the matrix representing the remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (changes of methane in the retrieved atmosphere relative to the changes of methane in the true atmosphere, Rodgers 2000).

1. **Term:** right\_singular\_vector of\_remote\_sensing\_averaging\_kernel\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: kernel\_right\_vector\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Right singular vectors of the matrix representing the remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (changes of methane in the retrieved atmosphere relative to the changes of methane in the true atmosphere, Rodgers 2000).

1. **Term:** rank\_of\_remote\_sensing\_averaging\_kernel\_of\_logarithm\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: fractional\_kernel\_rank\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Rank of the matrix representing the logarithmic scale remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (fractional changes of methane in the retrieved atmosphere relative to the fractional changes of methane in the true atmosphere, Rodgers 2000; Keppens et al., 2015).

1. **Term:** left\_singular\_vector of\_remote\_sensing\_averaging\_kernel\_of\_logarithm\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: fractional\_kernel\_left\_vector\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Left singular vectors of the matrix representing the logarithmic scale remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (fractional changes of methane in the retrieved atmosphere relative to the fractional changes of methane in the true atmosphere, Rodgers 2000; Keppens et al., 2015).

1. **Term:** singular\_value\_of\_remote\_sensing\_averaging\_kernel\_of\_logarithm\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: fractional\_kernel\_singular\_values\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Singular values of the matrix representing the logarithmic scale remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (fractional changes of methane in the retrieved atmosphere relative to the fractional changes of methane in the true atmosphere, Rodgers 2000; Keppens et al., 2015).

1. **Term:** right\_singular\_vector\_of\_remote\_sensing\_averaging\_kernel\_of\_logarithm\_of\_mole\_fraction\_of\_methane\_in\_air
Original term: fractional\_kernel\_right\_vector\_of\_mole\_fraction\_of\_methane\_in\_air

Description: Right singular vectors of the matrix representing the logarithmic scale remote sensing averaging kernels (Weber 2019; Schneider et al., 2022) of the methane mole fractions obtained by a remote sensing observation (changes of methane in the retrieved atmosphere relative to the changes of methane in the true atmosphere, Rodgers 2000; Keppens et al., 2015).

and two extra standard names raised in the discussion:

1. **Term:** true\_state\_altitude

Description: Atmospheric altitudes representing the true atmospheric state (analogous to the altitudes representing the measured or modelled atmosphere).

1. **Term:** eigenmode

Description: Modes representing different patterns (e.g. vertically correlated atmospheric patterns). Ordering is from most important modes to less important modes.

1. **Please also add:** true\_state\_pressure

Description: Atmospheric pressures representing the true atmospheric state (analogous to the pressures representing the measured or modelled atmosphere).

If you could correct the above names according to your understanding, and also propose a description for each name (this will of course repeat parts of the description, but a description for each is needed for clarity), that would be great.

I would also suggest that the references you included in your original post on this issue be added to the descriptions for these standard names, i.e.

* Keppens, A., Lambert, J.-C., Granville, J., Miles, G., Siddans, R., van Peet, J. C. A., van der A, R. J., Hubert, D., Verhoelst, T., Delcloo, A., Godin-Beekmann, S., Kivi, R., Stübi, R., and Zehner, C.: Round-robin evaluation of nadir ozone profile retrievals: methodology and application to MetOp-A GOME-2, Atmos. Meas. Tech., 8, 2093–2120, <https://doi.org/10.5194/amt-8-2093-2015>, 2015.
* Rodgers, C.: Inverse Methods for Atmospheric Sounding: Theory and Praxis, Series on Atmospheric, Oceanic and Planetary Physics – Vol. 2, edited by: Taylor, F. W., University of Oxford, World Scientific Publishing Co., Singapore, ISBN 981-02-2740-X, 2000.
* Schneider, M., Ertl, B., Diekmann, C. J., Khosrawi, F., Weber, A., Hase, F., Höpfner, M., García, O. E., Sepúlveda, E., and Kinnison, D.: Design and description of the MUSICA IASI full retrieval product, Earth Syst. Sci. Data, 14, 709–742, <https://doi.org/10.5194/essd-14-709-2022>, 2022.
* Weber, A.: Storage-Efficient Analysis of Spatio-Temporal Data with Application to Climate Research, Master Thesis, Karlsruhe Institute of Technology, <https://doi.org/10.5281/ZENODO.3360021>, 2019.

Best regards (and a happy new year!),
Ellie