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ON ASSESSING THE TEMPORAL VARIABILITY OF ARCTIC ENERGY BUDGETS

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While Arctic climate change can be diagnosed in many parameters, a comprehensive assessment of the changes and low frequency variability in the Arctic energy budget still poses substantial challenges. Recently a substantial number of upper air data back to the early 1950s have been digitized and made available in Russia. Those data have been assimilated in a pilot reanalysis (ERA-presat) covering the period 1939-1967. Improved sea ice cover and sea ice volume data together with ocean reanalysis and remotely sensed radiation data allow new insights into the transient energy budget of the Arctic back to 1979 and beyond, but they also reveal still existing data and model inconsistencies particularly on multiannual time scales. Temporal inhomogeneities in an advanced set of budget diagnostics as well as in essential input observations for atmospheric and coupled reanalyses are described. Ongoing and possible future steps towards improving these diagnostics within a coupled earth system reanalysis as it is developed in the EU project ERA-CLIM2 are outlined.