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The study of polar sea ice parameters retrieval using active and passive microwave payloads onboard Fengyun satellites

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Fengyun Satellite now has the ability to retrieve multiple parameters of polar sea ice based on active and passive microwave payloads. Three types of polar sea ice parameters, including FY-3 MWRI sea ice concentration and FY-3E WindRAD sea ice edge and type, have been operationally produced and released, where Fengyun Satellite's monitoring capabilities in the polar regions has been improved continuously. This report will systematically introduce the inversion and validation of polar sea ice parameters based on multi-source payloads from Fengyun satellites, with a focus on the sea ice parameter inversion using the world's first dual-frequency, dual-polarization, and fan-beam rotating scanning scatterometer FY-3E WindRAD from observation data, inversion algorithms, quality evaluation, and other aspects. The release and application of Fengyun Satellite's operational sea ice parameter products can further enhance the polar sea ice monitoring capabilities of Fengyung satellites, providing scientific and reliable new data sources for polar and global climate change related research such as climate numerical models and extreme climate event monitoring.