DPSIVS; an extensible and efficient verification system for Japan Meteorological Agency Global Spectral Model

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Forecast verification is an indispensable process in the development cycle of NWP system. A verification system needs to be computationally efficient to allow developers to promptly evaluate the impact of their work. It also needs to be easily extended to allow for its future evolution.

Deterministic Prediction System Integrated Verification System (DPSIVS) is a verification package "of the modelers, by the modelers, for the modelers" designed to meet these desiderata, which has been widely used among JMA GSM modelling commuty. DPSIVS is a package of multiple independent verification tools which include standard verification metrics, O-B and O-A statistics, maps of mean analysis and forecast fields, verification against GNSSRO and initial tendency method, among others. Each component is created and maintained by modelers themselves. DPSIVS, by design, allows modelers a one-stop execution of various verifications, and this has facilitated them to share and discuss their results among other experts.

This has been a key factor in understanding and reducing systematic errors, as systematic errors are caused from entangled components and are often compensated with each other in the state-of-the-art NWP system. Following the success of DPSIVS approach for NWP system development, similar tools are under active development for climate model experiments such as one-year run and AMIP run. The same approach is also applied to ensemble prediction system development.

DPSIVS and its family have been continuously evolving keeping in pace with JMA GSM, and have been the strong backbone behind recent progress of JMA GSM.