

New Kinematic Models for evolution of the Amerasia Basin: Overview and evidence

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New kinematic models for the formation of the Amerasia Basin were developed from comprehensive analysis of the bathymetry, gravity, and magnetic anomaly fields of the Arctic region, combined with available seismic data. Considering insufficient amount of tectonic and age constraints, two different tectonic models and three age models were examined.

The two tectonic models (A and B) provide two alternatives for the development of the proto-Canada Basin at its early stage, assuming different kinematics. The timing assignment for the tectonic models uses three alternative age models: with the opening of the central part of the Canada Basin occurring prior to ~124 Ma (Model 1), after ~124 Ma (Model 2), or with the entire basin forming after ~125 Ma (Model 3). Combining of tectonic and age models led to creation of six self-consistent kinematic models, referred to as “older” (1A and 1B) and “younger” models (2A, 2B, 3A, and 3B).

Considering all constraints available at this point, the set of “older” kinematic models is favored. They imply formation of the Canada Basin in Jurassic – Barremian with the central part generated in Valanginian (?) – Barremian (prior to ~124 Ma). This is concurrent with the final stage of the Arctida breakup and the main phase of the HALIP emplacement. During the breakup process, large shear zones were active, contributing to the opening of the Nautilus, Makarov, and Podvodnikov basins in the Valanginian (?)/Barremian – Campanian.

Some key evidences for proposed kinematic models, originated from geophysical data, will be provided in presentation.