

## constitutional symbolic dynamics of metamorphic banding

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## CONSTITUTIONAL SYMBOLIC DYNAMICS OF METAMORPHIC BANDING STRUCTURE

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The system of metamorphic rocks contains different kinds of subsystems; thermodynamic subsystem, reaction-diffusion subsystem, deformation-reaction subsystem, and fluid flow-reaction-deformation subsystem. These physical realities of metamorphic rocks are based on the phase assemblage topology, metamorphic structure formation, and strain-rotation signatures. Such realities are strongly dependent on each other, because metamorphic rocks are the typical open system in fluid containing all ionic species and gaseous components and mechano-chemical system in terms of plasticity and fracturing and their parameters change with time.

The metamorphic banding and more generally domain structure of minerals are modeled by dynamical systems involving reaction, diffusion, deformation, growth and coagulation. The forward modeling of these dynamical system has not been succeeded in interpretation of metamorphic banding and no inversion analyses of this type of structure formation has been proposed yet.

In this study, we try to find the common occurrence of banding metasomatism, so that they propose the inversion method using symbolic dynamics reconstitution of dynamical systems

The basics of symbolic dynamics is based on the sequential topology of the dynamical systems, and thus the robust symbolic sequence of mineral banding should indicate the sequential itinerancy of attractors in the physical parameter space. The authors intend to reconstruct the itinerant traction of these phase space in the metamorphic dynamical system.

Metamorphic banding is almost always composed of three or more kinds of thin layering. The layers are commonly bimineralic and the one displays growing outline but the other does resolved shape. The boundary of the layers is sometimes gradual, but rarely sharp. The layers do not cut the other layers, but they bifurcate making Y shape junction. These features strongly suggest that the layers are made at the conditions around the attractors in the chemical composition spaces in fluid phase. The attractors in this system are made by the symbolic dynamics of mineral phases. The dynamical system under the symbolic dynamics is strongly enhanced by the presence of circulating fluid phase in the metamorphic rocks.