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Distribution of active faults and fault model around the west foot of the Dewa hills, back-arc region of Northeast Japan

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Introduction
On the coastal area in the northeast Japan,Kitayuri fault system which is composed of Nosiro thrusts zone,Kitayuri thrusts zone,Nikaho thrusts zone, and Sakata trusts zone,extends for about 2 00 kilometers(Ohsawa.et.al 1984).Because the Dewa hills are located on hanging wall area of this Kitayuri thrusts system,it is supposed that this thrusts system have been play an important role in development of the Dewa hills and crustal shortening in the back-arc region of Northeast Japan since early Pliocene.
This study is made on around the Nikaho thrusts zone to reveal active tectonics around the west foot of the Dewa hills.
Method
First,geomorphological map of study area was drawn up to define distribution of active faults by deciphering aerial photographs and on-site investigation. Next,fault model was produced by using principle of balanced cross section: trial and error was repeated to decide fault geometry which can make deformed state from undeformed state.
Results & Discussion
1.The amount of crustal extension in the Miocene on the cross section through around Kisakata is more than 46km. The shortening distance since Pliocene in the onshore area on the same cross section is about 6km.
2.East-dipping fault(Kisakataoki fault)whose tip is located on about 3 km away from shore line is required from deformed geological structure around the coast area. Kotaki fault is a back thrust against Kisakataoki fault.
3.Nikaho thrusts are composed of 5~6 faults(Ohsawa et.al 1984).It is presumed that eastern two faults of these faults have developed Nikaho hill, and most eastern fault roots in a detachment at about 7km depth.And it is suggested by some characteristics of topography that most western fault is blind active fault located on the west margin of the Iseiji hill and has developed the Iseijii hill since middle Pliocene.
4.Growth mechanism of Nikaho hill is able to be explained by fault-bend-folding of pre-Tertiary basement rock and deformation of Quaternary-Tertiary rift fill which has been brushed aside by wedged pre-Tertiary basement rock.