In the present study, a set of industrial seismic lines from Lithuanian and Polish onshore part of the basin was analyzed, with a special emphasis on identification of structures related to Caledonian collision. Reflection seismic data in Lithuania reveal high angle reverse faults of Early Devonian (Lochkovian) age. The faults dip to the north and north-east and involve the crystalline basement; the offset is in the range of 50–200 m. On the southern flank of the basin, the faults dip mainly to the south. The disruption of the sedimentary pile was preceded by onset of the forced flexures over basement faults in Late Silurian time.

Also in the Polish part of the central Baltic Basin compressional structures involving Lower Palaeozoic deposits were recognized in the area of the Leba Elevation and NW slope of the Mazury Elevation. These structures are represented by reverse faults having offset of several dozens of metres and involving the basement and Lower Palaeozoic sediments. In some cases, the reverse faults pass up-section into flexures, involving competent Silurian shales. Overlying Rotliegend, Zechstein and Mesozoic sediments are not deformed. In the Polish part of the basin there is no direct evidence of Caledonian age of reverse faults and flexures. Due to presence of Zechstain evaporites the quality of seismic data does not allow to prove if these faults are of Late Silurian age (syn-sedimentary) or younger (Devonian-Early Permian).

Analyzed seismic sections, particularly these from Lithuanian part of the basin, allow identification of intra-plate compression related to late stages of development of Scandinavian and NorthGerman–Polish Caledonides. Also the complex geometry of the Silurian Baltic Basin, revealing large-scale gentle deformations of NW part of the Baltica plate, confirms that this was a zone of combined influence of both orogens at that time (Poprawa et al. 1999). The phase of compressional deformations of the Baltic Basin was followed by middle-Early Devonian post-orogenic uplift and regional erosion, particularly in the western part of the basin.

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The South Anyui collision suture zone (NE Asia): tectonic evolution and correlations of tectonic events in the eastern Arctic

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The South Anyui suture zone (SAZ) separated two main Mesozoic fold belts of the NE Asia: the Verkhoyansk–Kolyma belt and the Novosibirsk–Chukotka belt. The Verkhoyansk–Kolyma fold belt consists of shelf of various age, turbidite, cratonic, and island arc terranes, which build the Kolyma–Omolon amalgamated superterrane and Alazeya–Oloy accreted superterrane. Some ophiolite allochthons of Paleozoic age obducted in the Mesozoic from the Alazeya–Oloy superterrane side onto the Asia margin cratonic terranes. According to the paleomagnetic (Iosifidi 1988, Didenko *et al.* 1990, Lvov and Neustroev 1991, Bondarenko 2000) and paleobiogeographic (Shapiro and Ganelin 1988, Gagiev 1991) data all tectonic elements of the Verkhoyansk–Kolyma fold belt were narrow structural in relationship with the Asia craton, and collided with one in Jurassic to Cretaceous time.

The Novosibirsk–Chukotka fold belt is characterized by fundamental difference from the Verkhoyansk-Kolyma belt structural and stratigraphic features (Fujita 1978, Parfenov 1984, Zonenshain et al.). It consists of Paleozoic to Triassic shelf and turbidite terranes and cratonic terrane of North America origin (Noklenberg et al. 1997)). Geological, faunal and stratigraphic data show that the Novosibirsk–Chukotka belt is a part of the northern Alaska (Kosko et al. 1993, Noklenberg et al. 1997).

The South Anyui suture zone is a remnant of Late Jurassic to Early Cretaceous oceanic basin, which was closed after Asia and Chukotka microcontinent Early Cretaceous collision

(Seslavinsky 1979, Fujita and Newberry 1982, Parfenov 1984, Zonenshain et al. 1990). New data have shown that SAZ suture includes the Paleozoic and Middle–Earlest Late Jurassic ophiolite (Bondarenko et al. 1998, Sokolov et al. 2000). The SAZ inner structure traditionally interprated as a mainly subvertical fold-sheet high-deformed zone with width of 15–20 km (Natalin 1984, Parfenov 1984). According to our data this structure style is secondary quality and produced by secondary dextral wrench faults. The primary structure of the SAZ characterized by high-amlitude synform and antiform deformed nappes of north vergent. The different age ophiolite, Late Jurassic accretionary melange, Late Jurassic to Early Cretaceous volcani-terrigenous sequences, Late Jurassic supposedly island arc volcanic sequences, and metamorphic rocks construct the allochthonous slices. The autochthone is composed by high-deformed Triassic turbidite sequences of Chukotka margin and volcanic rocks of Late Jurassic Kul'polney island arc. The Kul'polney island arc sequences probably stratigrafically overlap the Triassic turbidite. The suprasubduction volcanics formed along the Asia margin (Alazeya–Oloy superterrane) of Anyui ocean during Late Paleozoic, Late Triassic and Late Jurassic to Early Cretaceous age. There are two main tectonic events recognised at the SAZ:

(1) Pre Late Triassic accretionary deformations along the southern margin of Anyui ocean;

(2) Earlest Lower Cretaceous collisional deformations as a result of Asia and Chukotka microcontinent collision. We suppose that oceanic spreading at the Canada basin and cownterclockwise rotation of the Chukotka-Arctic Alaska block was the reason of the Anyui ocean closing. The SAZ and Angayucham ophiolite suture zones probably mark the Paleozoic to Mesozoic Proto Arctic ocean (Anyui–Angayucham ocean). This ocean probably was connected with Ural ocean in Paleozoic time. The large scale sinistral strike slip fault zone must be limiting this ocean from the western side (modern coordinate) during Canada basin opening in Late Mesozoic. Proto Arctic ocean was limited from the Pacific during all time of it's existing by convergent margin system.

This work was supported by Russian FBR (grant 99-05-65649, 00-07-90000), Russian FCP "Integration" (grant M-00-99), INTAS (grant 96-1880) and NATO (grant 97-5739

Large-scale strata overturning generated by a two-order thrust propagation fold in front of a high-amplitude dome at the wedge–foredeep interface. A comparison between the Montagne Noire (southern French Hercynian belt) and the Alpine Southern Pyrenees

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Upside-down series are scarsely observed within developing foreland basins and usually restricted to small areas in front of thrust propagation folds near the wedge-foredeep boundary. The Montagne Noire, which is a 15 kilometres wide dome situated at the apex of the wedge of the South European Variscides, has long been known for showing on its southern flank unusually widespread upside-down series. These upside-down series are related to fold and thrust structures that emplaced in the developing foreland basin and have, in general, been interpreted as the lower limb of a refolded large-scale recumbent fold postdated by thrust faults. This interpretation, however, fails to explain the controls of sedimentation by the emplacing thrust sheets as recognized by the sedimentological studies.

We propose here another interpretation aimed at being compatible with both the geometry of the large-scale structures in the orogenic wedge and the tectonics-sedimentation relationships in the foreland basin. The model is derived from the CAS model established in the South Central Alpine Pyrenees (Deramond et al., 1995, Geological Society Special Publication, 71, 193–219) and involves a large-scale thrust-propagation fold that controlled the sedimentation during the development of the foredeep. The progradation of the deposits and the individualization of the depositional sequences recognized in the basin is attributed to the overstep propagation of second-order thrusts and related folds. The essential differences between the Montagne Noire and the Southern Pyrenees are that, in the Montagne Noire, the second-order thrust-propagation folds are larger and more accentuated and the