Several classical theorems chcaracterizing the unit ball up to biholomorhpism were presented. In the first part we mentioned the Bun Wong theorem (strictly pseudoconvex domain with non compact automorphism group is biholomorphic to a ball) and the Diedercih-Fornaess-Wold criterion based on the boudnary behavior of the squeezing function.

In the second part we discussed function-theoretic chcaracterizations. The Stoll-Burns theorem was mentiond. Then we moved to the following theorem of S.Y. Li: Let Ω be a weakly pseudoconvex domain and let the exhausting psh function u solves

$$det((u)_{j\bar{k}}) = ge^{(n+1)u}$$

for a positive function g with $log(g)$ being pluriharmonic. Suppose $\min_\Omega u = 0$. Then if

$$liminf_{z\longmapsto\partial\Omega} det((log(1-e^{-u}))_{j\bar{k}}) \geq 0$$

then the domain Ω is biholomorphic to the unit ball.

A relation with the Feffereman's potential was briefly discussed.