

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

**Doping-Induced Evolution of Superconducting Order Parameter
in Ba(Fe_{1-x}Ni_x)₂As₂ Single Crystals¹**

CONG REN, Laboratory for Superconductivity, Institute of Physics, China, ZHAOSHENG WANG, HUIQIAN LUO, HUAN YANG, LEI SHAN, HAIHU WEN, Laboratory for Superconductivity, IOP — We report a systematic investigation on the *c*-axis point-contact Andreev reflection (PCAR) in BaFe_{2-x}Ni_xAs₂ superconducting single crystals with the Ni concentrations from underdoped to overdoped regions ($0.075 \leq x \leq 0.15$). At low temperatures, an in-gap peak at low-bias voltage is observed in PCAR for overdoped samples, in contrast to the case of underdoped junctions, in which an in-gap plateau is observed. The spectra are fitted using a generalized Blonder-Tinkham-Klapwijk (BTK) formalism with two gaps: one isotropic and another angle dependent. The second gap, resulted from the fitting, shows a clear crossover from a nodeless in the underdoped side to a nodal feature in the overdoped region. This intriguing observation provides strong evidence of the doping induced evolution of the superconducting order parameter when the inter-pocket and intra-pocket scattering are tuned through doping, as expected in the s_{\pm} scenario.

¹This work is supported by the Natural Science Foundation of China, the Ministry of Science and Technology of China.

Cong Ren
Laboratory for Superconductivity, Institute of Physics, China

Date submitted: 17 Nov 2010

Electronic form version 1.4