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Doping-induced evolution of superconducting gap in iron-based superconductors: a point-contact Andreev reflection study of BaNi-122 single crystals[1] CONG REN, ZHAOSHENG WANG, BING SHEN, HUIQIAN LUO, XINGYE LU, ZHENYU WANG, JUN ZHU, JUN GONG, XINGYUAN HOU, CHUNHONG LI, LEI SHAN, Laboratory for Superconductivity, Institute of Physics, HUAN YANG, HAIHU WEN, Department of Physics, Nanjing University — We report a systematic investigation on c-axis point-contact Andreev reflection (PCAR) in superconducting $BaFe_{2-x}Ni_xAs_2$ single crystals from underdoped to overdoped regions ($0.075 < x < 0.15$). At optimal doping ($x = 0.1$) the PCAR spectrum feature a dip-hump structure at the edge of the conductance gap, which corresponds to electron-boson coupling mode in energy scale. Two-superconducting-gap structure is resolved in the PCAR spectroscopy. In the $s_{\pm}$ scenario, quantitative analysis using a generalized Blonder-Tinkham-Klapwijk (BTK) formalism with two gaps: one isotropic and another angle dependent, suggest a nodeless state in strong-coupling limit with gap minima on the Fermi surfaces. Upon crossing above the optimal doping ($x > 0.1$), the PCAR spectrum show an in-gap sharp narrow peak at low bias, in contrast to the case of underdoped samples ($x < 0.1$), signaling the onset of deepened gap minima or nodes in the superconducting gap. This result provides evidence of the modulation of the gap amplitude with doping concentration, consistent with the calculations for the orbital dependent pair interaction mediated by the antiferromagne

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