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Evidence for line nodes in the energy gap of overdoped $Ba(Fe_{1-x}Co_x)_2As_2$: A low-temperature specific heat study[1] GANG MU, Department of Physics, Graduate School of Science, Tohoku University, Japan, JUN TANG, YOICHI TANABE, JINGTAO XU, World Premier International Research Center, Tohoku University, Japan, SATOSHI HEGURI, Department of Physics, Graduate School of Science, Tohoku University, Japan, KATSUMI TANIGAKI, Department of Physics, Graduate School of Science and World Premier International Research Center, Tohoku University, Japan — We report the low-temperature specific heat (SH) study on $Ba(Fe_{1-x}Co_x)_2As_2$ single crystals in a wide doping region under different fields. For the overdoped sample, we find the clear evidence for the presence of T^2 term in the electronic SH data, suggesting the presence of line nodes in the energy gap. This term is absent both for the underdoped and optimal doped samples. Moreover, the field induced electronic SH coefficient $\Delta\gamma(H)$ increases more quickly with the field for the overdoped sample than the underdoped and optimal doped ones, showing a large anisotropy of the gap for the overdoped sample. Our results suggest that the energy gap(s) in the present system may have different structures strongly depending on the doping regions.

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