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Self Energy Analysis of Photoemission spectral function from parent cuprates, $\text{Ca}_2\text{CuO}_2\text{Cl}_2$ CHUL KIM, DONG JOON SONG, CHOON SHIK LEEM, HYEONG UK JIN, SEUNG RYONG PARK, Yonsei University, HYEONG DO KIM, Pohang Accelerator Laboratory, FILIP RONNING, Los Alamos National Laboratory, CHANG YOUNG KIM, Yonsei University, YONSEI UNIVERSITY TEAM, POHANG ACCELERATOR LABORATORY COLLABORATION, LOS ALAMOS NATIONAL LABORATORY COLLABORATION — Self energy $\Sigma(\mathbf{k},\omega)$ is the fundamental function that describes the effects of many-body interactions on an electron in a solid. But it is very difficult to extract the self energy from experimental data, especially for non-metallic materials. In this paper we developed a new and general method with which one can extract the self energy from angle-resolved photoemission spectroscopy (ARPES) data in the full \mathbf{k} - ω space. We demonstrate the validity of this method by applying it to the ARPES data from $\text{Ca}_2\text{CuO}_2\text{Cl}_2$ (CCOC). We find the values for the imaginary part of the self energy is compatible with the value obtained by measuring the peak width.

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