Surface structure and electronic properties in Ca$_{10}$(Pt$_4$As$_8$)(Fe$_2$As$_2$)$_5$\textsuperscript{1} JISUNG KIM, GUORONG LI, AMAR KARKI, JIANDI ZHANG, RONGYING JIN, E.W. PLUMMER, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LA 70803 — Among Iron-based superconductors, a new family of Ca$_{10}$(Pt$_n$As$_8$)(Fe$_2$As$_2$)$_5$ with n = 3 (“10-3-8”) or n = 4 (“10-4-8”) is unique owing to the existence of Pt$_n$As$_8$ layer. This sets them with different electronic properties than the rest of Iron-based superconductors. By cleaving 10-4-8 single crystals ($T_c$ ~ 34 K) in the ultra-high vacuum, we are able to observe three surfaces: Ca layer, FeAs layer, and Pt$_4$As$_8$ layer. Scanning tunneling microscope (STM) reveals both the topology and electronic density of individual layers. We discuss the implications of our results with the combination of bulk electronic properties.

\textsuperscript{1}NSF DMR-1002622

Jisun Kim
Department of Physics and Astronomy, Louisiana State University,
Baton Rouge, LA 70803

Date submitted: 28 Nov 2012