Criticality in the $N$-flavor London model\textsuperscript{1} ASLE SUDBO\textsuperscript{2}, NTNU, JO SMISETH, NTNU, EIVIND SMORGRAV, NTNU, EGOR BABAEV, NTNU — We consider the critical properties of $N$-flavor London model in $d = 2 + 1$ dimensions in the phase-only approximation, with no inter-flavor Josephson coupling. The model applies to superconducting phases of projected metallic states of light atoms and as effective theories for easy-plane quantum antiferromagnets. MC simulations with $N = 2$ and unequal bare phase stiffnesses of the components show two anomalies in the specific heat. From the critical exponents $\alpha$ and $\nu$, the mass of the gauge field, and vortex correlation functions, we conclude that these anomalies correspond to an inverted 3D$xy$ and a 3D$xy$ fixed point. The $N = 2$ model with equal phase stiffnesses exhibits one non-3D$xy$ critical point due to self-duality. For $N = 3$ and unequal bare phase stiffnesses we find two neutral 3D$xy$ fixed points and one charged fixed point. The model with the two lower phase stiffnesses equal exhibits one neutral fixed point and one charged fixed point. We find a non-3D$xy$ fixed point with $N = 3$ and equal bare phase stiffnesses. For the general $N$-flavor model with unequal phase stiffnesses there are $N$ fixed points, namely one inverted 3D$xy$ fixed point, and $N - 1$ fixed points in the (neutral) 3D$xy$ universality class. Hence, we find superfluid modes arising from charged condensates.

\textsuperscript{1}Work supported by NANOMAT
\textsuperscript{2}Talk will be presented by J. Smiseth