

USC, DEPARTMENT OF PHYSICS & ASTRONOMY.

Graduate student problem competition

OCT 16–OCT 27, 2024

All graduate students are eligible to participate.

To submit your solution, e-mail it to bazaliy@mailbox.sc.edu

Electric field near the edge of a capacitor

You have two identical large rectangular plates positioned one under the other at a vertical distance d (see figure). They are charged uniformly with charge densities $+\sigma$ (upper plate) and $-\sigma$ (lower plate). The width of the plates is $W \gg d$, the length is $L \gg W$. Point M is located right above the midpoint of the longer edge, at a height h above the upper plate, and $W \gg h \gg d$ holds.

In this limit, find the magnitude and direction of electric field at point M .

