We live in a world where electronics are part of our lives. The telecommunications industry uses electronics to create fast internet connections and the healthcare industry develops electronic equipment that helps us grow old in a healthy way. In the future, the dependency of our society on electronics will increase even further.

To keep up with this growth, we need manufacturing tools that can operate in a vacuum in order to achieve the extreme precision required to make higher density chips. One of the necessary tools for the next generation of electronics is an electrostatic clamp (ESC), which uses an electrostatic force to handle wafers in vacuum. To ensure proper operation and avoiding damage to the wafer, the electrical behavior of the ESC has to be known in great detail. During my MSc final project, I have designed a model to capture formerly unknown dynamic effects that occur in ESCs. This model has been verified in experiments and can be used to facilitate a more reliable chip manufacturing process and therefore enable smaller, faster and cheaper electronics for the future.

Modeling Dynamic Effects in High-Voltage Electrostatic Clamps

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