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(54) **PHYSICAL UNCLONABLE FUNCTIONS WITH SILICON-RICH DIELECTRIC DEVICES**

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(57) **ABSTRACT**

Systems for physical unclonable function ("PUF") generation, PUF devices, and methods for manufacturing PUF devices. In one implementation, the system includes a plurality of PUF devices and an electronic controller. Each of the plurality of PUF devices include a first electrochemically-inactive electrode, a second electrochemically-inactive electrode, and a layer of silicon suboxide. The layer of silicon suboxide is positioned directly between the first electrochemically-inactive electrode and the second electrochemically-inactive electrode. The electronic controller is communicably coupled to the plurality of PUF devices. The electronic controller is configured to read binary values associated with the plurality of PUF devices.