Switched Capacitors

Bipolar amps tend to use resistive feedback
MOS amps in the early days couldn't drive as much current
Berkeley led the charge on capacitors in FB
MOS make good switches

Simple model: short or open
Next: resistor or open

SC circuits have 1 or more clock signals often
with non-overlapping phases

\[
\begin{align*}
\phi_1 & : 0 \\
V_{DD} & \\
\phi_2 & : 0 \\
\end{align*}
\]

Clock phases open and close switches (FETs)
which rewire the circuit.
"During \( \phi_1 \), "During \( \phi_2 \)"

**Ex:**

\[
\begin{align*}
V_i & \\
V_o & \\
\end{align*}
\]

\[
\begin{align*}
& -V_i + \frac{1}{C_i} \frac{dQ_i}{dt} = 0 \\
& Q_i = V_i C_i \\
& Q_{ee} = 0
\end{align*}
\]

**During \( \phi_1 \)**

Between \( \phi_1 \) and \( \phi_2 \)

\[
\begin{align*}
Q_{ci} & = V_i C_i \\
Q_{ee} & = 0
\end{align*}
\]