

Effective bulk-surface thermistor models for OLEDs

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We consider a thin-film OLED device placed on a flat surface, part of a bulk substrate material. The device is assumed to have $N > 2$ layers and total thickness $h > 0$. An effective electrothermal model is derived by considering the limit of vanishing thickness h as it approaches zero under physically motivated scalings. The effective equations consist of two equations for the lateral current flow in the top and bottom electrodes and an iterative set of algebraic equations for the vertical flow in the organic layers posed on the flat surface where the OLED is placed and coupled to the heat equation in the bulk substrate material.