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CORRECTION





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# Correction: Stabilization of negative capacitance in ferroelectric capacitors with and without a metal interlayer

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Correction for 'Stabilization of negative capacitance in ferroelectric capacitors with and without a metal interlayer' by T. Rollo, *et al.*, *Nanoscale*, 2020, **12**, 6121–6129, DOI: 10.1039/C9NR09470A.

The authors regret that the value of $\beta$ in the caption of Fig. 4 was incorrectly given as $4.5 \times 10^9$ m$^5$ C$^{-2}$ F$^{-1}$. The correct value of $\beta$ is $2.25 \times 10^{10}$ m$^5$ C$^{-2}$ F$^{-1}$. Fig. 4, along with the full corrected caption, is displayed below.

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.

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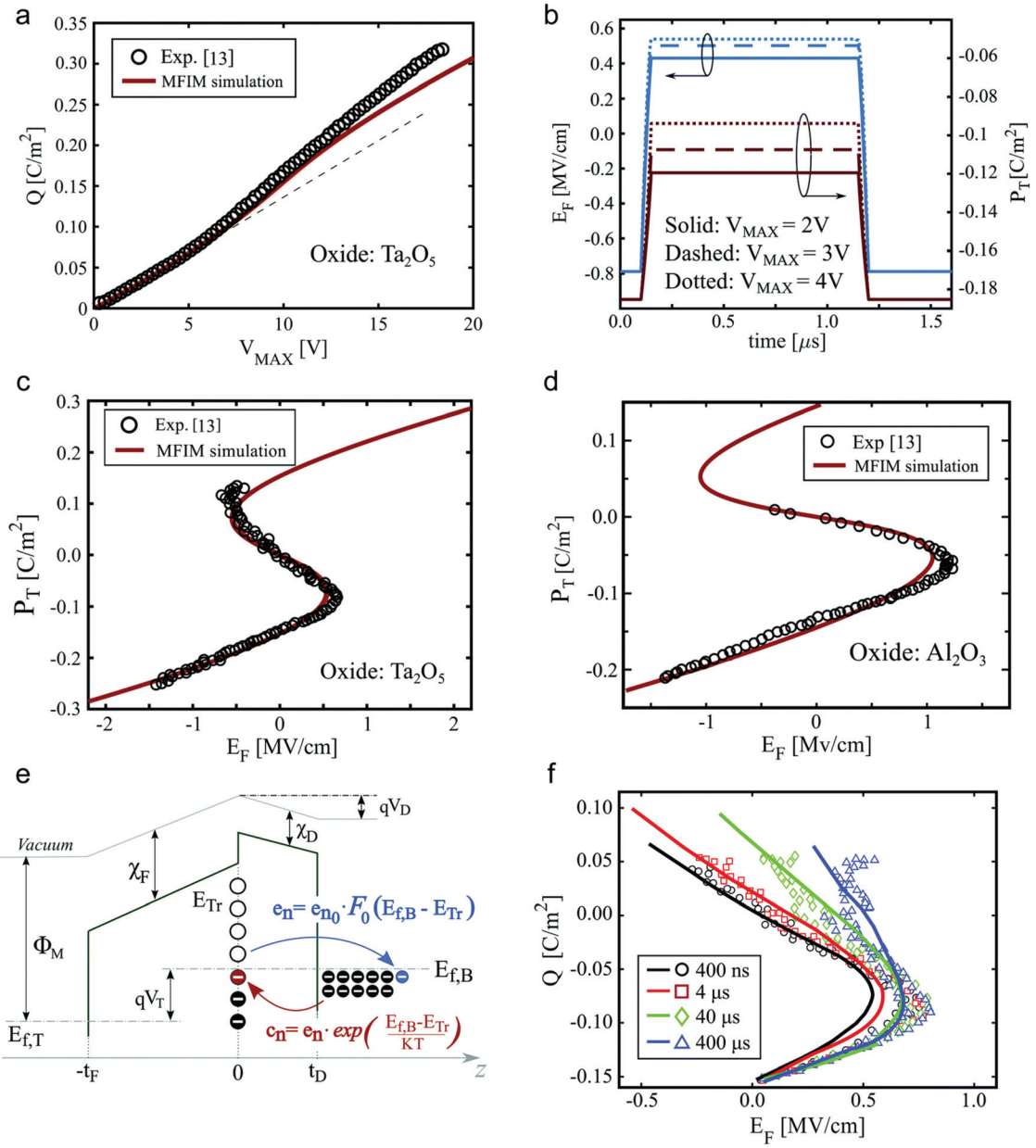


**Fig. 4** Comparison between simulations and experiments. Measurements (symbols) and simulations (lines) for the MFIM structures in ref. 12 and 13. For the $Hf_{0.5}Zr_{0.5}O_2$–$Ta_2O_5$ capacitor the simulation parameters are $\varepsilon_F$ = 33, $\varepsilon_D$ = 23.48, $t_F$ = 11.6 nm, $t_D$ = 13.5 nm, $\alpha$ = −4.6 × 10$^8$ m F$^{-1}$, and $\beta$ = 9.8 × 10$^9$ m$^5$ C$^{-2}$ F$^{-1}$, while for the $Hf_{0.5}Zr_{0.5}O_2$–$Al_2O_3$ system the parameters are $\varepsilon_D$ = 8, $t_F$ = 7.7 nm, $t_D$ = 4 nm, $\alpha$ = −9.45 × 10$^8$ m F$^{-1}$ and $\beta$ = 2.25 × 10$^{10}$ m$^5$ C$^{-2}$ F$^{-1}$;[12,13] for both capacitors we used $\rho$ = 0.5 mΩ m and $k$ = 2 × 10$^{-9}$ m$^3$ F$^{-1}$ m$^{-1}$. (a) Reversibly stored and released charge, $Q$, *versus* the top value $V_{MAX}$ of the trapezoidal voltage waveform across the capacitor. (b) Simulated ferroelectric field and charge *versus* time produced by a trapezoidal input $V_T$ with a pulse width of 1 µs and for different $V_T$ amplitudes. (c) Polarisation *versus* ferroelectric electric field for the $Hf_{0.5}Zr_{0.5}O_2$–$Ta_2O_5$ MFIM capacitor. (d) Polarisation *versus* ferroelectric electric field for the $Hf_{0.5}Zr_{0.5}O_2$–$Al_2O_3$ capacitor. (e) Sketch of the band structure of the MFIM device with representation of the emission and capture mechanisms. (f) Simulated charge *versus* ferroelectric $E_F$ curves for different pulse widths of the input signal and fixed density $N_T$ = 7.5$^{12}$ eV$^{-1}$ cm$^{-2}$ of acceptor type interface traps with a uniform energy distribution. In these simulations the emission rate is $e_{n0}$ = 5 × 10$^4$ s$^{-1}$, the metal gate work-function is $\Phi_M$ = 4.05 eV, and the electron affinity is $\chi_F$ = 2.2 eV for $Hf_{0.5}Zr_{0.5}O_2$ and $\chi_D$ = 3.2 eV for $Ta_2O_5$.[29]