**II**

**I**

**a**

**b**

**c**

**d**

z (nm)

0

10

20

30

40

50

x (mm)

0

1

2

3

4

5

**t = 96.0857 ps**

0

1

2

3

Intensity (a.u.)

**t = 144.1285 ps**

0

1

2

3

Intensity (a.u.)

**t = 264.2356 ps**

0

1

2

3

Intensity (a.u.)

x (mm)

0

1

2

3

4

5

x (mm)

0

1

2

3

4

5

0

0.05

0.1

0.15

0.2

Energy (eV)

Fig. 1. **a,** Schematic representation of two periods (module I and II) of the active region of the simulated structure together with the relevant wave functions, calculated in the tight-binding basis. **b**-**d,** Consecutivesnapshots from Maxwell-Bloch equation simulations of a 30 picosecond pulse propagating through 2 mm length of the active region in **a**.