a)

EM wave

metal

dielectric

Evanescent waves

b)

30nm

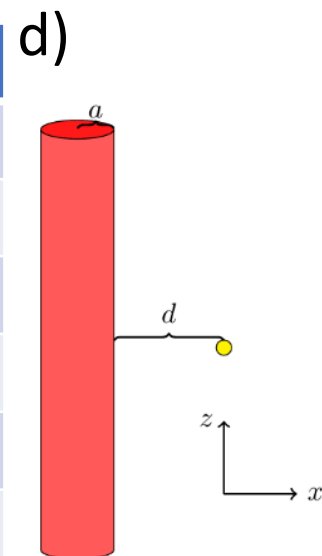c)

	σ (S/m)
Room temperature bulk [3]	$3.8 \cdot 10^7$
300nm width, thermal evaporated, 4 K	$3.9 \cdot 10^7$
100nm width, thermal evaporated, 4 K	$3.4 \cdot 10^7$
30nm width, thermal evaporated, 4 K	$\mathbf{1.6 \cdot 10^7}$
300nm width, EBPVD, 4 K	$6.9 \cdot 10^7$
100nm width, EBPVD, 4 K	$4.2 \cdot 10^7$

d)

a

d

z

x

e)

d(nm)	$T_{1,x}^{-1}(s^{-1})$ theory	$T_{1,y}^{-1}(s^{-1})$ theory	$T_{1,z}^{-1}(s^{-1})$ theory	$T_{1,z}^{-1}(s^{-1})$ measured
20	5.8	6.1	4.1	1.1 (2013A) 0.36 (2017A)
50	0.6	1.3	1.1	-