

QUIZ on Lecture P1_Wk5_L5

1. If you are performing contact mode scans and the tip is continually crashing into the substrate while scanning, you might want to
 - a) decrease the gain of the proportional and integral controllers
 - b) select another experiment with a different substrate
 - c) increase the gain of the proportional and integral controllers
 - d) realign the laser onto the cantilever
2. After careful simulations, you arrive at optimal values for P and I in VEDA. Can these exact values for P and I be used on your AFM instrument when doing experiments?
 - a) No, because the values of P and I depend on the exact software code that is implemented
 - b) Yes, there should be no problem – you can use the same values of P and I obtained from VEDA on your AFM instrument
3. One reason why AFM PI controllers can be difficult to tune is that
 - a) noise at different frequencies often plays a dominant role in the AFM feedback signal
 - b) the AFM system under control can have variable time constants AND time delays
 - c) several attempts must be made to optimize the settings
 - d) all of the above
4. When comparing VEDA simulations to experimental AFM data, which input simulation parameter is perhaps the most difficult to accurately estimate?
 - a) the elastic modulus of the substrate
 - b) the elastic modulus of the tip
 - c) the spring constant of the cantilever
 - d) the radius of the tip