

ACOUSTICS2008/1373 Observations on bow changes in violin performance

Matthias Demoucron^a, Anders Askenfelt^b and René Causse^a

^aIRCAM, 1 Place Igor Stravinsky, 75004 Paris, France

^bDept. of Speech, Music and Hearing, Royal Institute of Technology (KTH), Lindstedtsvägen 24, SE-100 44
Stockholm, Sweden

Players of bowed instruments commonly separate notes by changing the direction of the bow motion ("bow changes"). The separation can be made more or less pronounced (detaché - portato - martellato). In contrast, long notes, requiring more than a full bow stroke, are played by making the bow changes as inaudible as possible. Acceptable bow changes require accurate control and coordination of a set of bowing parameters, in particular bow speed, bow force and bow-bridge distance. Long practice is required before optimal control is achieved. Detailed descriptions of basic bowing gestures such as bow changes are of great interest for various field of violin-related studies, including realistic control of synthesis algorithms. We present recent measurements that provide an accurate description of the evolution of bow speed, acceleration and bow force during bow changes at the tip and the frog, respectively. Using these data for controlling a synthesis algorithm, we will discuss how modifications of the parameters influence the bow-string interaction and resulting string vibrations. The simulations are used to model efficient implementations of bow changes.