



Exploring dependency between instrument design and musician's control

Patricio de la Cuadra¹, Augustin Ernoult² and Benoit Fabre³

⁽¹⁾ Pontificia Universidad Catolica de Chile

⁽²⁾ Aix Marseille Univ, CNRS, Centrale Marseille, LMA, UMR 7031, Marseille

⁽³⁾ LAM Sorbonne Universite France

pcuadra@uc.cl

Abstract

In flute-like instruments the pitch of the notes produced depend on the instrument geometry as well as on the control the musician exerts on it. Thus, a particular flute design requires from the musician a specific strategy to obtain a set of notes “in tune” with a certain cultural intonation agreement. The control parameters available in most flutes include the jet speed and the opening of one end of the flute, normally adjusted by the proximity from the lips to the labium. In this paper we explore the relationship between the design of the instrument and the control exerted by the musician, proposing algorithms to automatically design the bore geometry and position and size of the tone holes for different musicians control strategies.