



Abstract: "ASTRA Project: ancient musical instruments reconstruction and modern computing techniques"

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ASTRA (Ancient instruments Sound/Timbre Reconstruction Application) is a project aiming to reconstruct the sound or timbre of ancient musical instruments (not existing anymore) using archaeological data as input, like fragments from excavations, written descriptions, pictures.

The technique used is the physical modeling synthesis, a complex digital audio rendering technique which allows modeling the time-domain physics of the instrument. In other words the basic idea is to recreate a model of the musical instrument and produce the sound by simulating its behavior as a mechanical system.

The application would produce one or more sounds corresponding to different configurations of the instrument (i.e. the different notes).

Physical modeling is a really computing intensive technique since the complex models of the musical instruments are solved by integrating numerical coupled differential equations. This is the why ASTRA is currently being implemented and deployed on a GRID computing environments (large-scale distributed computation) like GILDA (<https://gilda.ct.infn.it>), the GRID INFN Laboratory for Dissemination Activities and EUMEDGRID (a EU-funded project to bring the GRID technologies in the Mediterranean area).

First tests on those infrastructures have been carried out in July 2007 successfully reproducing the sound of a single string instrument (Monochordum) coupled to a wooden resonant structure. Currently it is under study a Lyra reconstruction and the sound simulation of ancient woodwinds.