ESRF	**Experiment title:** Local structure and dynamics in novel niobates and tungstates proton conductors	**Experiment number**: CH-3128
Beamline: BM01B	**Date of experiment**: from: 2/3/2010 to: 9/3/2010	**Date of report**: 12/7/2010
Shifts: 12	**Local contact(s)**: Hermann Emerich	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

Francesco Giannici* (Università di Palermo, Italy)

Alessandro Longo* (ISMN-CNR, Palermo, Italy)

Diego Angelo Messana (Università di Palermo, Italy)

Antonino Martorana (Università di Palermo, Italy)

Report:

Prior to the experiment, we synthesized in our laboratory: a) doped lanthanum niobates $La_{1-x}M_xNbO_4$, with x = 0, 0.01, 0.02, and M = Ca^{2+}, In^{3+}, Ti^{4+}; b) doped trilanthanum niobates $La_{2-x}M_xNbO_4$, with x = 0, 0.01, 0.02 and and M = Ca^{2+}, In^{3+}, Ti^{4+}; c) tungsten-doped fluorites, Nd_6WO_{12} and La_6WO_{12}. The samples were synthesized from elementary oxides or carbonates using solid-state synthesis, and they are stable in ambient conditions. Protonation was subsequently achieved by equilibration with water vapour at 300 °C, and confirmed by thermogravimetric analysis. Single-phase formation and purity was checked with a Bruker D500 diffractometer.

X-ray absorption spectra (XAS) were taken on the W L_3-edge (10.2 keV) and on the Nb K-edge (19 keV) in transmission mode. The samples were mixed with boron nitride to form self-sustaining pellets, which were cooled with a liquid nitrogen stream to about 90 K. The extended X-ray absorption fine structure (EXAFS) spectra are currently being analyzed with Feff 8.4 and Viper.