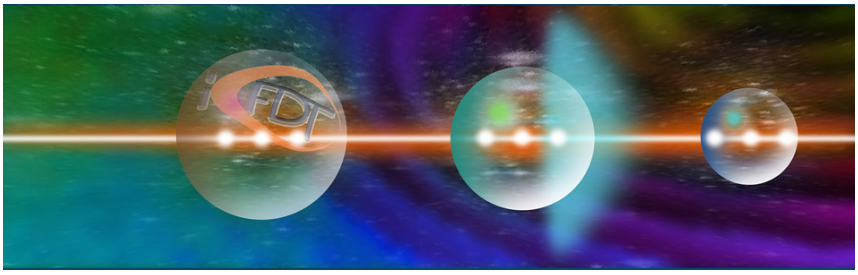

Contribution ID: **60** Type: **Poster**

Thin and ultrathin conducting MoO3 films on copper: a new route for improved RF devices.

Thursday, 4 October 2018 14:30 (1h 30m)

One of the main goals of the next generation of accelerators is to use cavities with higher RF fields, reducing significantly the length of particle accelerators. In order to accomplish these objectives is necessary to reduce the overheating effects due to the RF and to the electrical breakdown that induce damages on the surface of any RF device. In order to accomplish these objectives is necessary to reduce the overheating effects due to the RF and to the electrical breakdown that induce damages on the surface of any RF device. One of the possible solutions is to cover the inner metallic surface of a RF device with harder materials like a transition metal (TM) oxides [1,2].
In particular we describe the properties of molybdenum trioxide thin films deposited on a thick metallic copper substrate manufactured with a low roughness. Actually, a thin layer of molybdenum trioxide, a hard transparent insulator deposited on copper tends to be conductive, while its work function remains almost constant and higher than the original copper surface[3,4,5]. We developed and built a dedicated evaporation setup to growth by vacuum sublimation molybdenum trioxide films on copper and we measured both the conductivity and work function. Morphological characterizations and spectroscopic experiments have been performed to support the interpretation of the conductive behavior of thin layers of molybdenum oxides on copper.

1. M.T. Greiner, L. Chai, M.G. Helander, Wing-Man Tang, Zheng-Hong Lu, Adv. Funct. Mater. 23 (2013) 215–226
2. S. Lagotzky, R. Barday, A. Jankowiak, T. Kamps, C. Klimm, J. Knobloch, G. Müller, B. Senkovskiy, F. Siewert, Eur. Phys. J. Appl. Phys. 70 (2015) 21301-p8
3. A. Marcelli, B. Spataro, S. Sarti, V.A. Dolgashev, S. Tantawi, D.A. Yeremian, Y. Higashi, R. Parodi, A. Notargiacomo, J. Xu, G. Cappuccio, G. Gatti, G. Cibin, Surf. Coat. Tech. 261 (2015) 391-397
4. A. Marcelli, B. Spataro, G. Castorina, W. Xu, S. Sarti, F. Monforte, G. Cibin, Condensed Matter 2 (2017) 18; doi:10.3390/condmat2020018
5. C. Bonavolontà, M. Valentino, M. de Lucia, M. Ambrosio, C. Aramo, S. Macis, I. Davoli, G. Castorina, F. Monforte, B. Spataro, M. Scarselli, S. Lupi and A. Marcelli; SIDS-Pubblicazioni INFN-17-13/LNF May 6, 2017

Summary

Primary author: Dr MACIS, Salvatore (Università Roma Tor Vergata)

Co-authors: MARCELLI, Augusto (LNF); Dr CIBIN, Giannantonio (Diamond Light Source); Dr DE PADOVA, Irene Paola (ISM CNR); DAVOLI, Ivan (RM2)

Presenter: Dr MACIS, Salvatore (Università Roma Tor Vergata)

Session Classification: POSTER SESSION