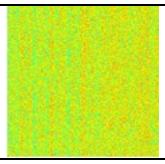
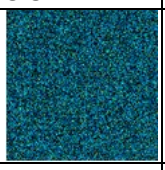
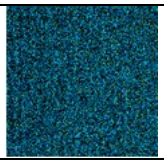
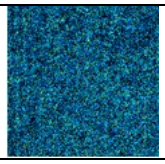
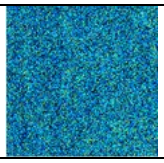
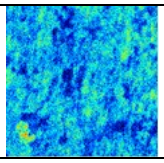
	Ag	Cu	Zn	Pb	Fe	Ti	Cr	Hg	
0$10 - 1940	**-**	**96.0**	**4.0**						**Law**
	-	96.0	3.8	0.1	0.05	0.02	0.02		IBA
									
0$20 – 1916	**83.5**								**Law**
	97.3	2.7	-	0.02	0.01				IBA
									
2$50 – 1944	**65.0**								**Law**
	93.5	6.4	-	-	0.01	-	-	0.02	
									
1 rupia 1912	**91.6**								**Law**
	92.7	7.3		0.02	0.04	0.01			IBA

Table 1. Recent results from the IST and Lib.Phys groups. The analysis by means of IBA techniques of silver coins from the Portuguese Republic show: an inhomogeneous distribution of the constituents on the surface; presence of trace impurities (iron (Fe), lead (Pb) and titanium (Ti)); the concentration of silver on the coins is higher than the one decreed by the Laws. On the other hand, for a Cu-Zn coin, both composition data (from the Law and IBA techniques) are similar.

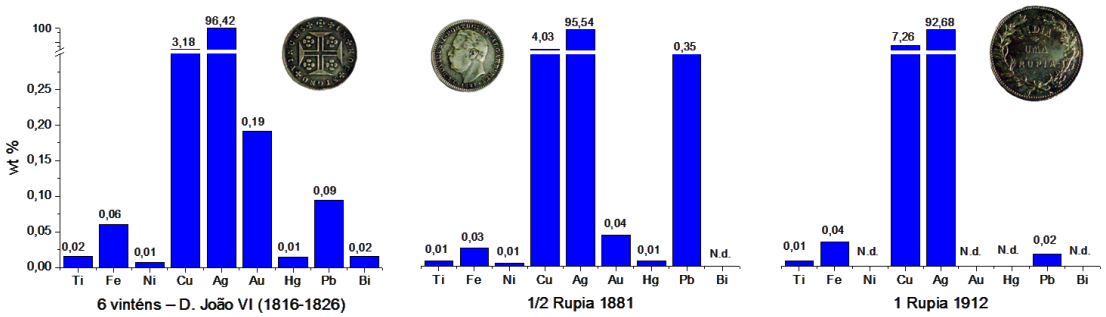


Figure. 1. Comparison of impurities concentration (wt.%) found in three Portuguese silver coins: 6 vinténs of D. João VI (1816-1826), ½ rupia coin from 1881 and 1 rupia coin from 1912. The impurities concentration (Ni, Au, Hg or Bi) decreases with time which is related with the improvements of the purification process of the raw materials; considering coins from the XIX century, differences in impurities concentration, specially the lead, can indicate a different ore silver to mint the coins from Continental Portugal and from India ex-colony.

Figure2. Two RTI Lighting setups and a RTI coin image example, the strips are RTI (brilliant) versus non-RTI (mate). (Courtesy of T. Malzbender)

Figure3. Dome prototype already available developed by IST and LIBPhys groups; Screen capture of video showing the RTI coin image recorded by the research groups, see [22].