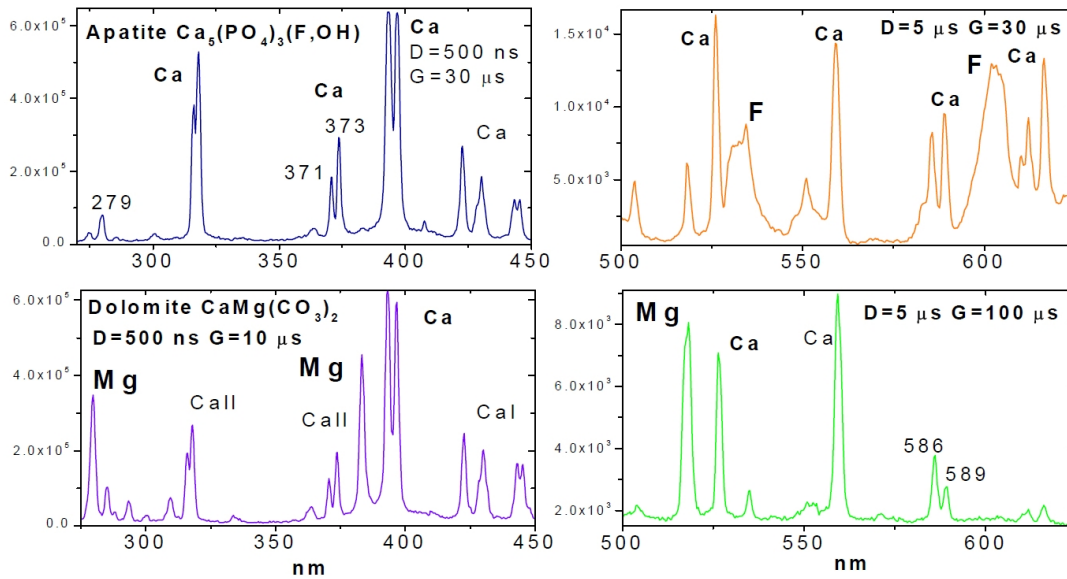


Report

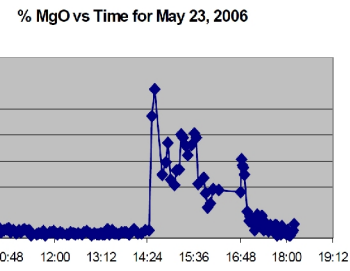
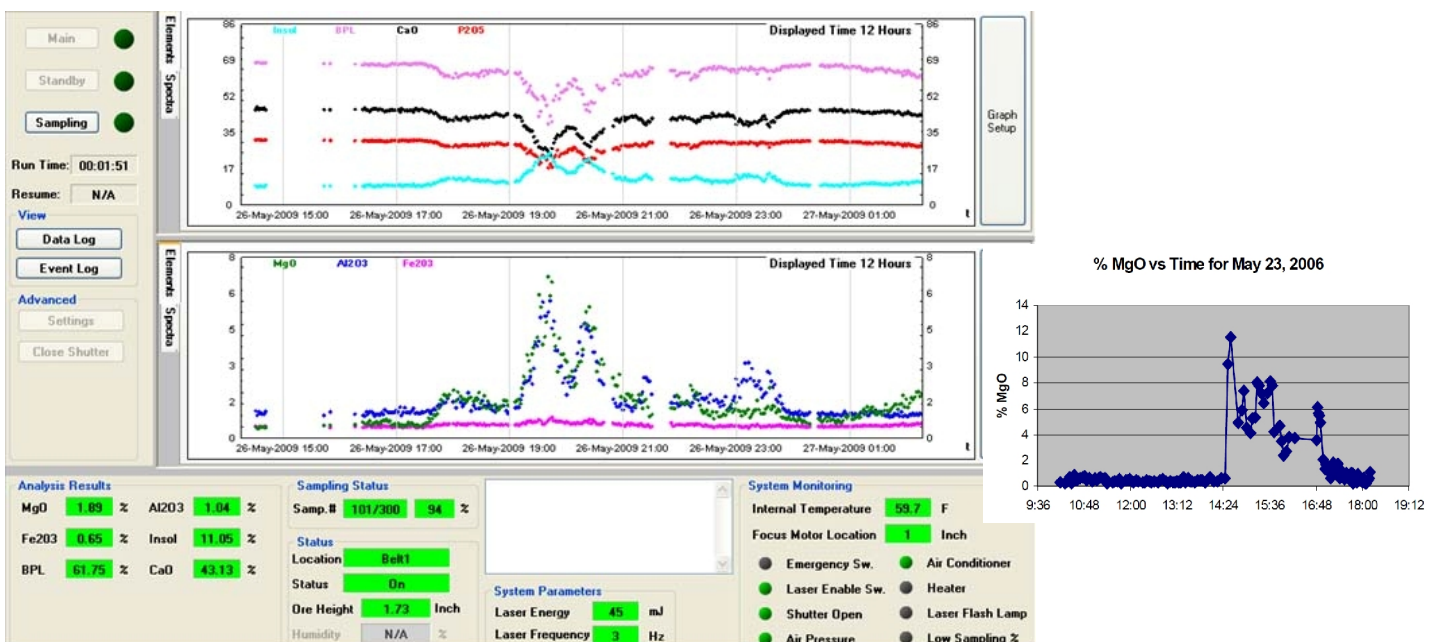
Discarding dolomite from phosphate ores in Florida (USA)

Phosphate rock deposits in Florida are highly contaminated by dolomite impurity. Dolomite $\text{CaMg}(\text{CO}_3)_2$ contains 21.8% of MgO which has highly negative influence on further production and final price of the product. This makes it very critical to control the quality of the pebble product, particularly the MgO content. Because of frequent and rapid ore content changes, laboratory samples cannot represent the conveyed material. A reliable on-line, continuously measuring, analytical LIBS method is the ultimate solution to this problem.

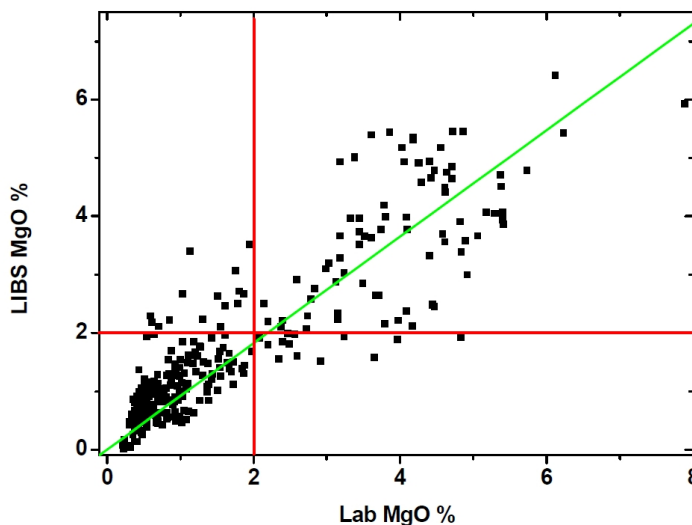
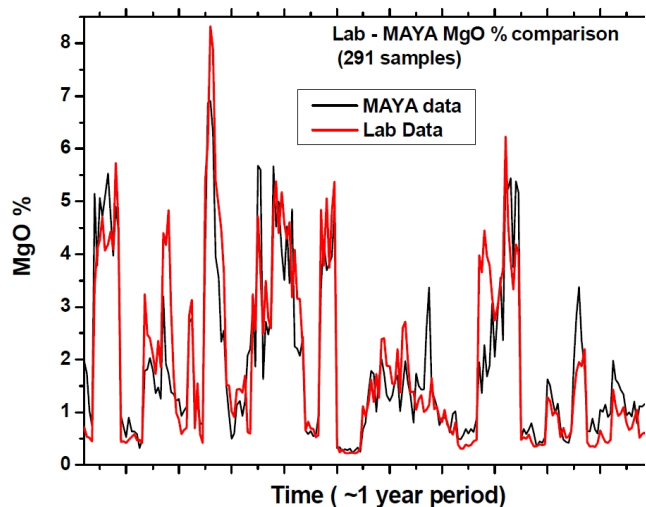


An industrial LIBS machine was developed for on-belt evaluation of phosphate quality, measuring Mg, Fe, Al, Bone Phosphate Lime (BPL), Insoluble phase and Metal Impurity Ratio (MER).

Two percent MgO pebble content was decided to be considered as a decision point for “bad,” high MgO % rock discarding.



291 samples were collected during 1 year: $R^2=0.8$ and absolute average error = $\pm 0.51\%$. The comparison of the results demonstrated that 92.8% of the rock samples indicated by LIBS as high MgO % pebble were later verified as such by laboratory measurement.

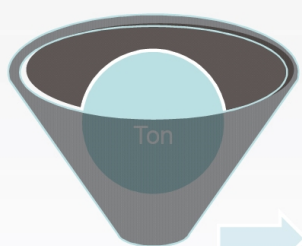


Some systems are already in use in phosphate industry in USA (Florida) and participate in beneficiation process in order to separate between different ore qualities.

Estimation of economic benefits for these systems

Evaluation of profit from removing high MgO rock from the production process

	Rock now
Tons	2,000,000
Level of MgO	1
¹ Value/Ton, \$	109.64
Total Value, \$	219,280,000
Profit by Discarding	



²Rock discarding

Balance
1,900,000
0.53
118.53
225,207,000
5,927,000