

## ***Interactive comment on “Recognition of a porphyry system using ASTER data in Bideghan – Qom province (central of Iran)” by F. Feizi and E. Mansouri***

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The following is answers to the comments made by Anonymous Referee #1: 1- Using remote sensing methods in mining exploration has found very special place in recent years. 2- These methods are well known around the world and were introduced base on distinguished model and specific elements. 3- In the result section only the result of each particular method has been discussed. These results were then integrated to produce the final conclusion. 4- As noted previously, these methods are well known and used in case studies. Therefore, the descriptions of these patterns are available in the text books and not in research papers. 5- Although there are numerous references

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for remote sensing available, only the references which had similarities with this case study and used were listed in the reference list. 6- I will be happy to correct any specific problem that you would like to note. 7- As mentioned previously, these methods were not new. However, they have been applied to new places to produce the results. The methods were used in Bideghan for the first time to introduce a porphyry system. 8- preprocessing is always performed prior to start with any method, and authors felt that it was understood. The following is the preprocessing method that was performed by the authors: Data format (HDF) was used for this research. To remove atmospheric and topographic effects from ASTER SWIR and ASTER VNIR data, the log-residual method (LRM) Green, A. A., Berman, M., Switzer, B., & Craig, M. D. (1988) was used. The log-residual algorithm reduces noise from topography, instruments, and sun illumination, and was available as part of the analytical module used. The resulting data can be assumed to be more representative of the soils or lithologies of the exposed areas than the unprocessed data. Hence, a spectrum generated from data treated using the log-residual method will be more closely comparable to its corresponding library spectrum. Because the log-residual algorithm reduces noise from topography, instruments, and sun illumination, the processed ASTER SWIR and ASTER VNIR data will allow comparison of the synthesized spectrum with those from the library. 9- The interpretation of the PCA has been completely written in [ 3.1.2 Principal Component Analysis ]: Table 1 shows the eigenvector loadings for bands 1, 2, 3 and 4. Inverse of PC3 can show the areas with iron oxide. Table 2, shows the eigenvector loadings for bands 1, 4, 5 and 7. In according to the results, image related to PC3 shows the argillic alteration. Table 3 shows the eigenvector loadings for bands 1, 3, 5 and 6. Inverse of PC4 can show the areas with phyllic alteration. Table 4 shows the eigenvector loadings for bands 2, 5, 8 and 9. PC4 can show the areas with propylitic alteration (Fig 5). 10- In this paper, data layers were integrated by Index over layer method, and alteration zones were confirmed by field investigation as it has shown in figures. 11- The observation of Malachite and Azurite and the position of alteration zones confirmed the presence of a porphyry system and, hence, the correction of obtained results. 12- Remote sensing

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methods are used in prospecting stage which is the first step in mining exploration. The aim of this stage is to be able to narrow in on the area which needs to be further explored. The specific sampling scheme does not belong in this stage and is only performed in detail exploration stage. 13- The authors thank you for your kind review of their paper.

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Interactive comment on Solid Earth Discuss., 6, 1765, 2014.

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