

Multi-Band CARSS Airborne PoSAR Image Classification

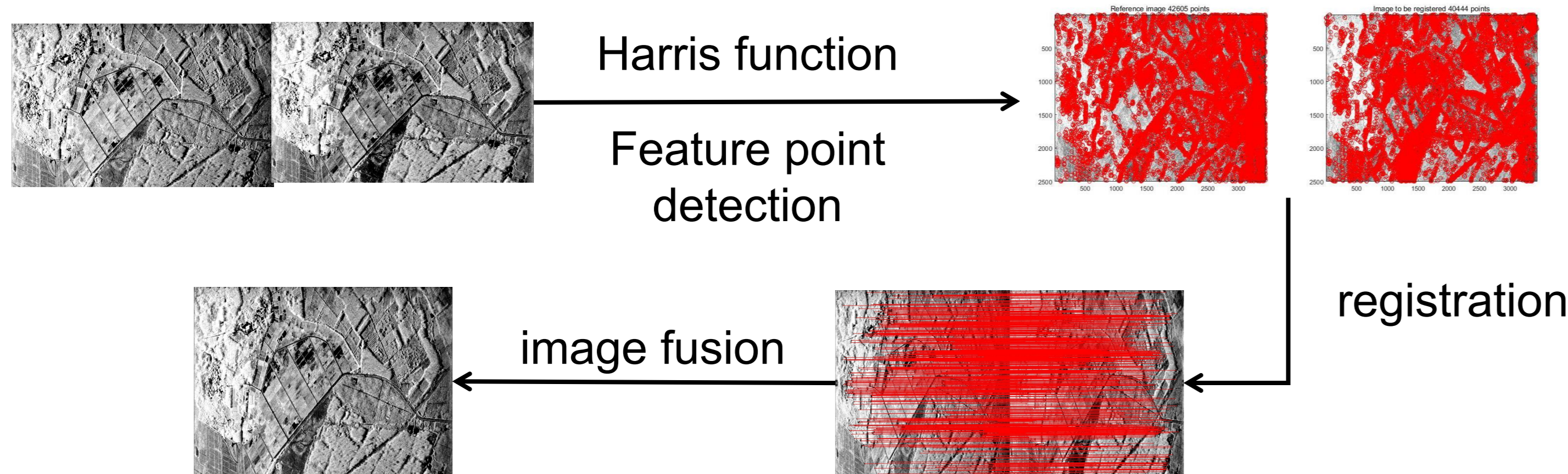
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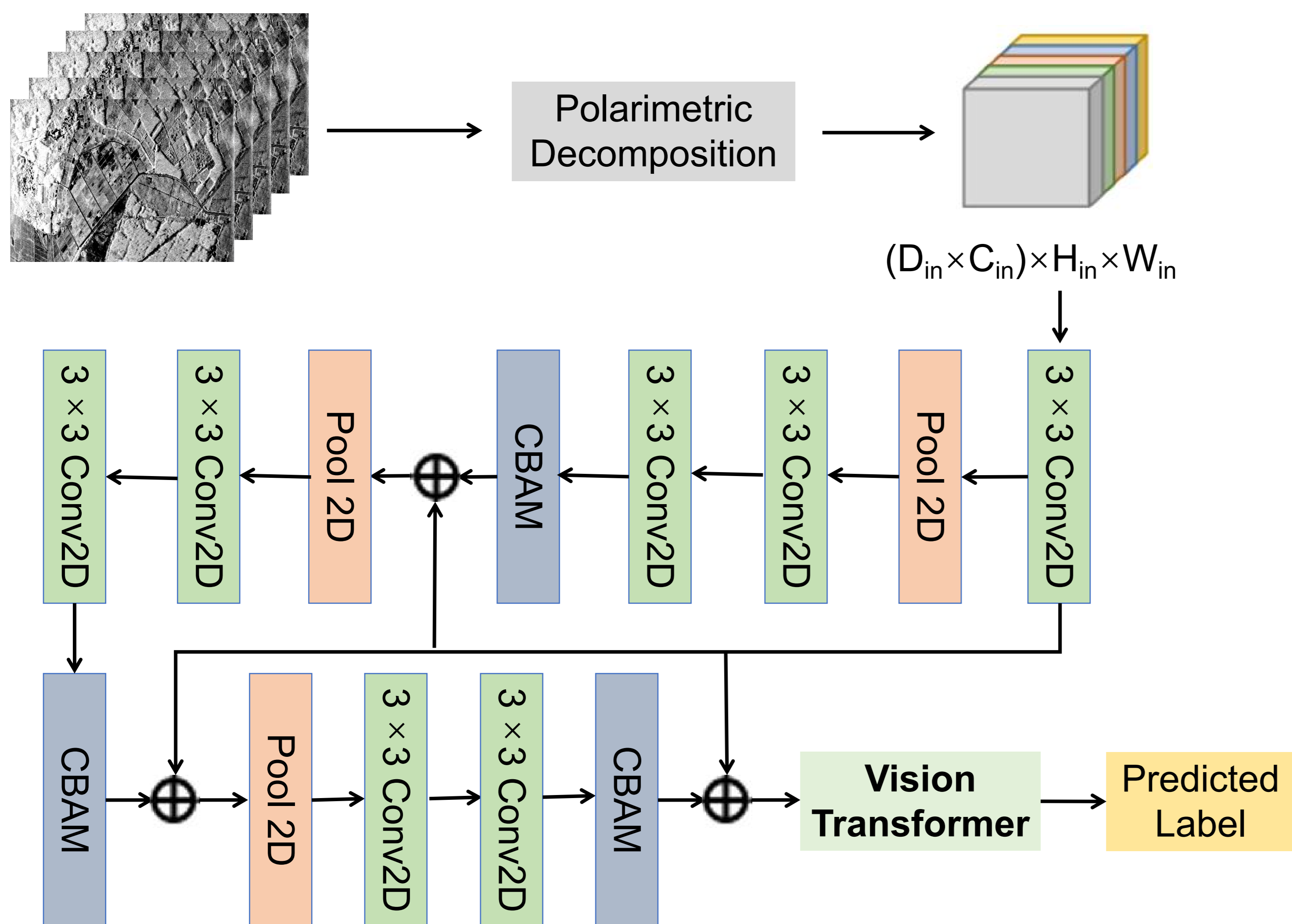
Introduction

- Considering that the scattering characteristics of the same sample have scattering differences in different bands, multi-band data were introduced.
- We combine polarized scattering features with multi-band scattering information for multi-feature fusion to improve the classification accuracy.
- The Transformer structure is introduced to PoSAR Multi-Band data for classification.

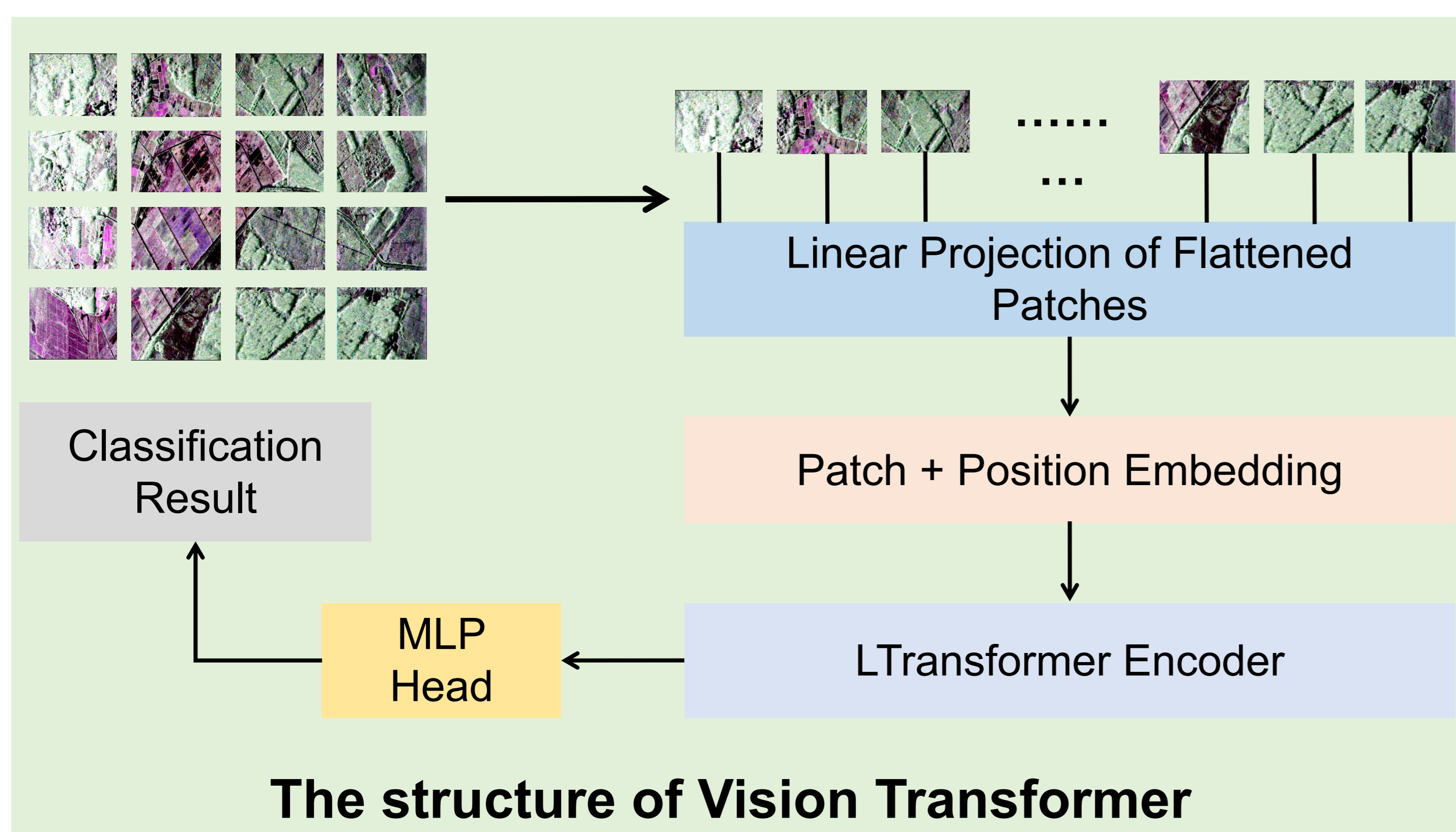
Methods



Example of multi-band scattering feature image registration

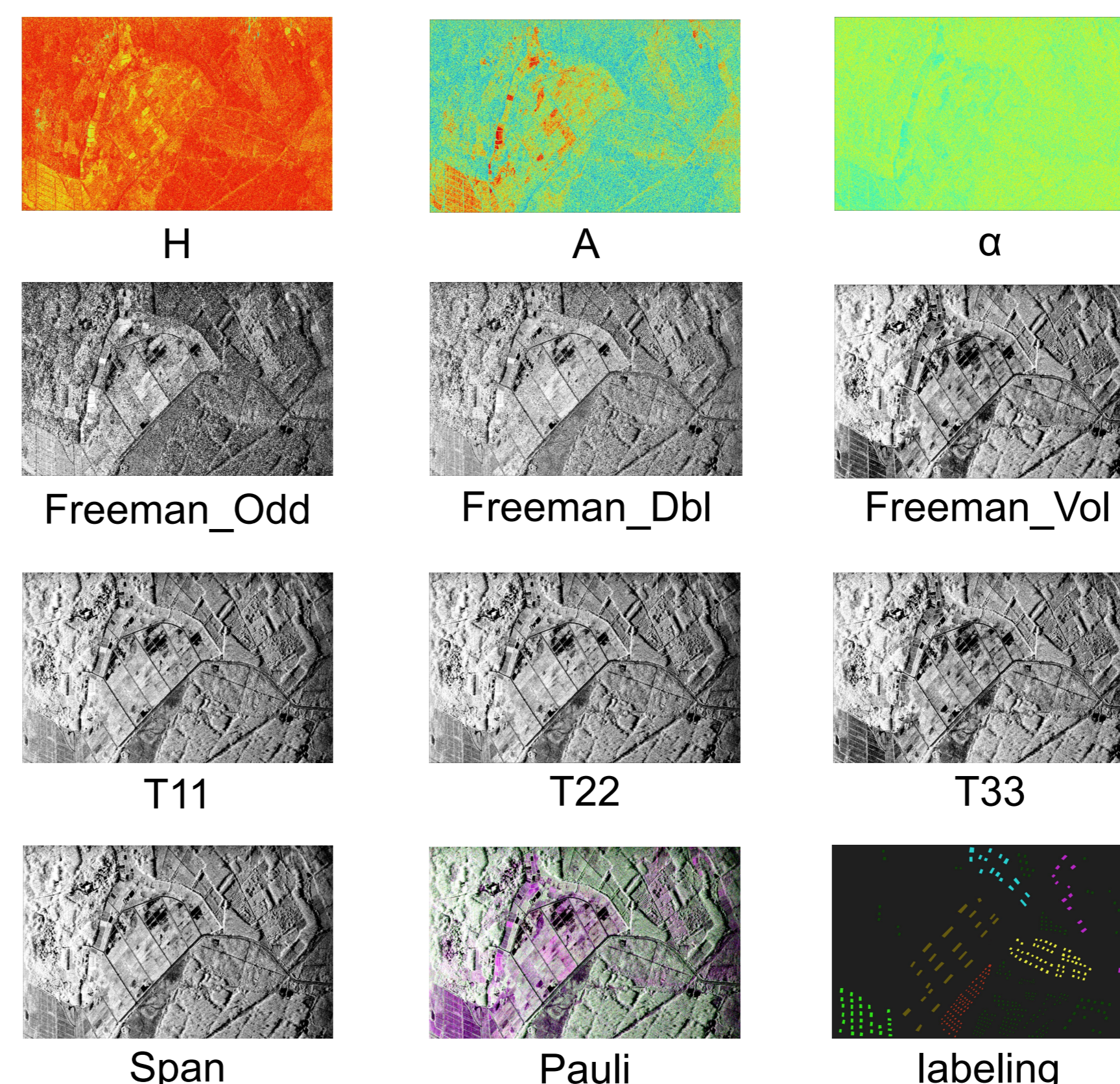


Multi-feature fusion network model



The structure of Vision Transformer

Datasets

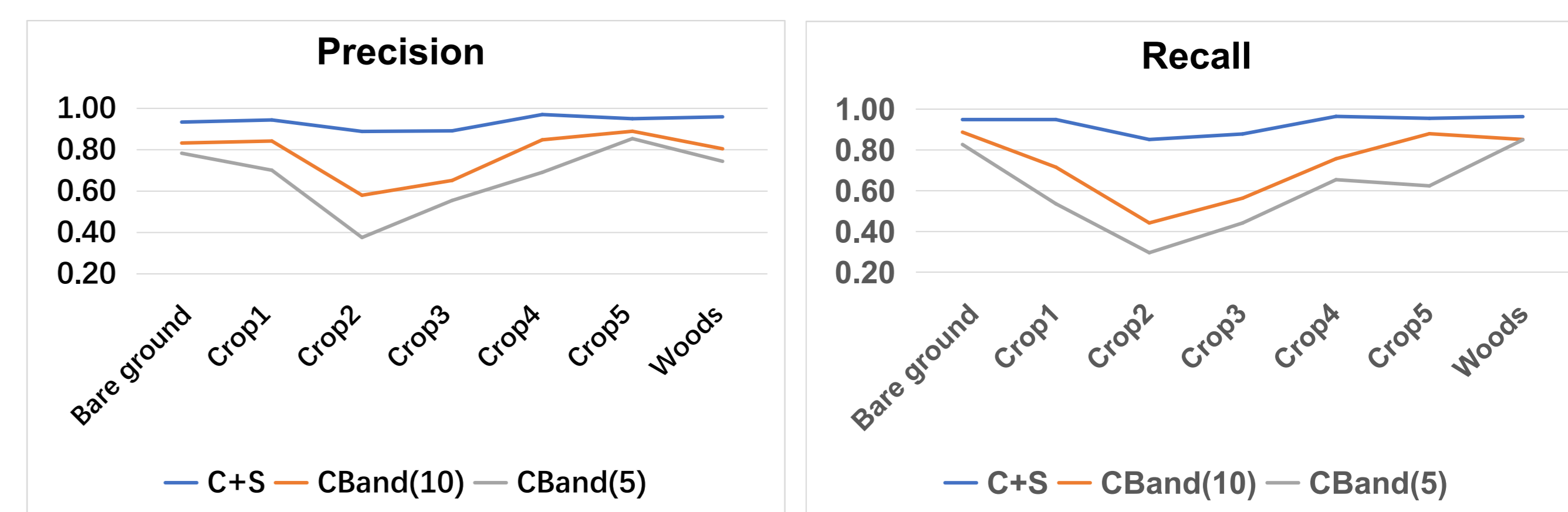


- Chinese Aeronautic Remote Sensing System (CASSR) PoSAR Data
- 3400 x 2500
- H, A, α , Freeman, Span, T11, T22, T33
- CBand&SBand (C-band feature map on the left)
- Wanning, China

Experiment

Table1 Classification of different features

Categories	Number of features	Accuracy
CBand	5	72.90%
CBand	10	80.34%



We selected seven crop samples and combined them with polarized radar scattering features to observe the effect of different bands on the classification results. (The sample was trained at around 5%)

Table2 Classification Accuracy Comparison

Categories	Accuracy
CBand	72.90%
SBand	70.87%
C&S Fusion	93.65%

Conclusions

- Under certain conditions, for samples in the same band, the greater the number of fused scattering features, the higher the classification accuracy of the samples.
- The accuracy of multi-band image fusion classification has obvious advantages, the classification accuracy is improved by more than 10%, and the classification accuracy of various types of samples is higher.