Adjustable SAR-MS Fusion (ASMF) for Diverse Geo-spatial Applications
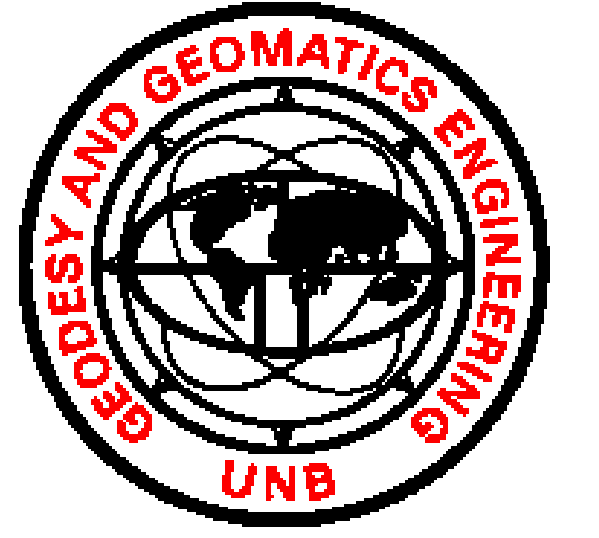
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Currently, most SAR-MS image fusion techniques are developed to fuse high resolution SAR with low resolution MS images. Users do not have an option to adjust the proportion between SAR and MS information according to the need of specific applications.
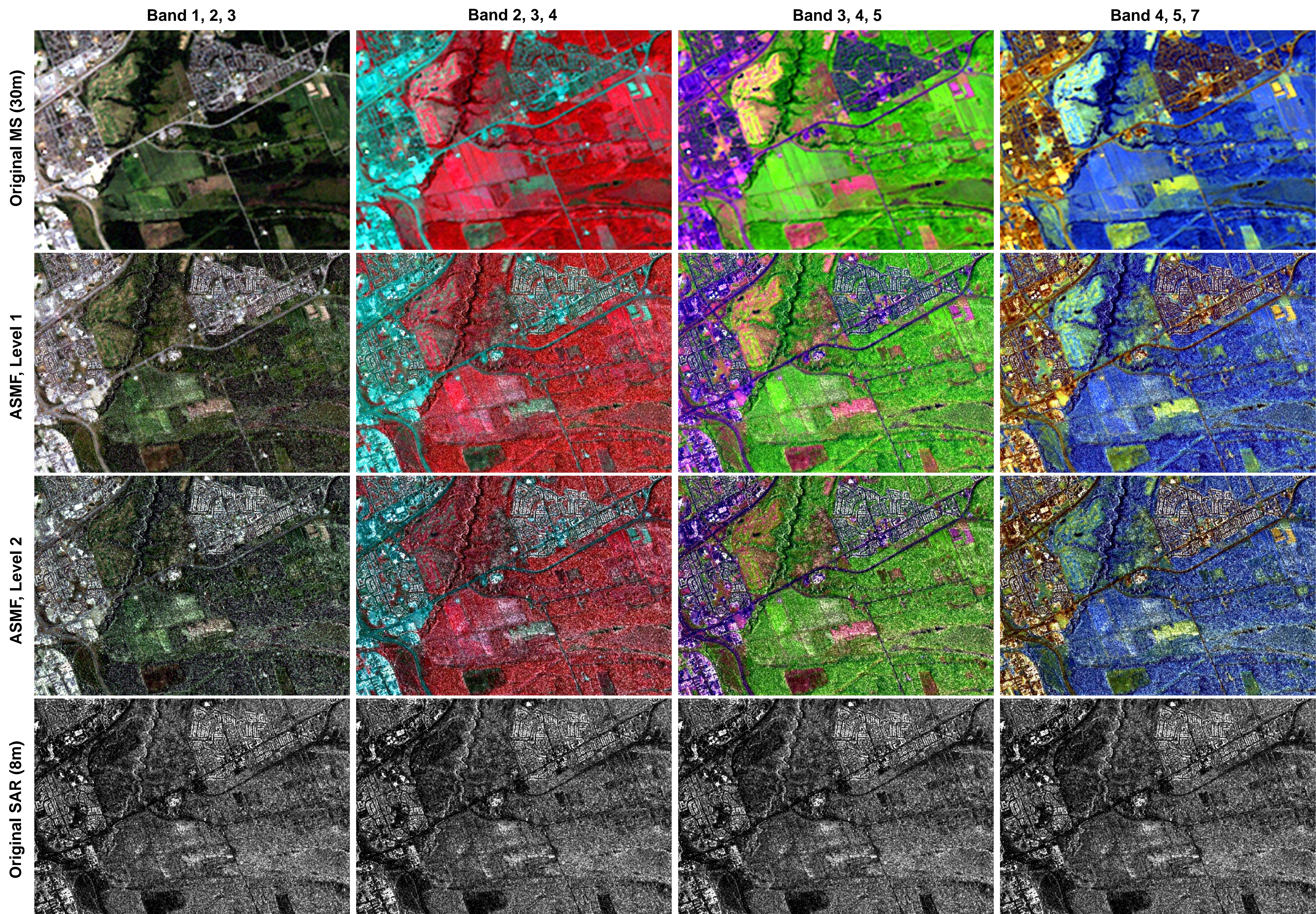
Along with the fast increase of diverse SAR and MS images, the demand for a flexible, yet robust SAR-MS fusion technique is fast increasing, i.e. while keeping the original SAR and MS information, users need to have an option to adjust the proportion between SAR and MS information in the fusion.

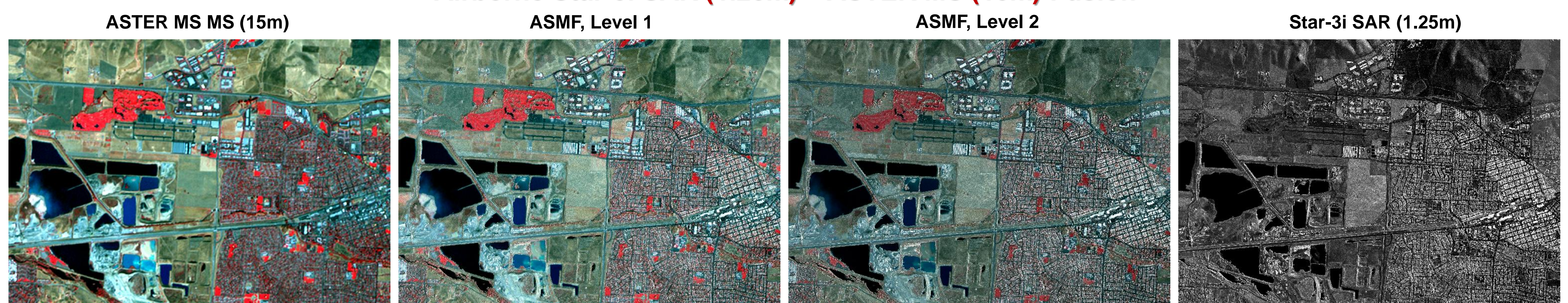This paper presents a new technique for underlined adjustable SAR-MS fusion (ASMF), which allows users to
1) fuse SAR and MS images at a user desired level of SAR and MS information integration;
2) fuse high resolution SAR with low resolution MS; and also
3) fuse low resolution SAR with high resolution MS.

- The ASMF results below are just a few examples.
- The proportion between SAR and MS can be adjusted continuously, not just 2 levels.
- For display purpose, all the images below are stretched using the same linear stretching.

Radarsat SAR (8m) – Landsat TM (30m) Fusion

	Band 1, 2, 3	Band 2, 3, 4	Band 3, 4, 5	Band 4, 5, 7
Original MS (30m)				
ASMF, Level 1				
ASMF, Level 2				
Original SAR (8m)				

Airborne Star-3i SAR (1.25m) – ASTER MS (15m) Fusion

| ASTER MS MS (15m) | ASMF, Level 1 | ASMF, Level 2 | Star-3i SAR (1.25m) |

Radarsat SAR (12.5m) – Ikonos MS (4m) Fusion

| Ikonos MS (4m) | ASMF, Level 1 | ASMF, Level 2 | Radarsat SAR (12.5m) |

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