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K&C Initiative

An international science collaboration led by JAXA

PALSAR-2 processing & Capacity issues

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4.2.1

PALSAR-2仕様及びモードの整理

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Mode	Spotlight (S)	Ultra Fine (U)	High Sensitive (H)	Fine (F)	ScanSAR Nominal (W)	ScanSAR Wide (V)
Bandwidth	84MHz	84MHz	42MHz	28MHz	14MHz	28MHz
Resolution	Rg × Az: 3 × 1m	3m	6m	10m	100m(3 looks)	60m(1.5 looks)
Swath	Rg × Az: 25 × 25km	50km	50km	70km	350km 5scan	490km 7scan
Polarization	SP	SP/DP	SP/DP/FP/CP		SP/DP	
NESZ	-24dB	-24dB	-28dB	-26dB	-26dB	-23dB
S/A	Rg	25dB	25dB	23dB	25dB	20dB
	Az	20dB	25dB	20dB	20dB	20dB
REC	D	D	D	S	D	D
DC	B4	DB4 DB2	B4 DB4	B4 DB4	B4	B4

SP : HH or VV or HV , DP : HH+HV or VV+VH , FP : HH+HV+VH+VV , CP : Compact pol (Experimental mode)

REC: Number of receivers(受信機数: Dual, S: Single), DC: Data Compression, DB4:DS-BAQ4,B4:BAQ4

Spotlight (S):

Detail observation of damaged area

Ultra Fine(U):

High Resolution (Japan area baseline)

High sensitive(H):

Flood / Coast monitoring

Fine(F):

Global observation (deformation/forest)

ScanSAR nominal(W):

ScanSAR InSAR (28MHz)

ScanSAR wide(V):

Ice monitoring, Ship detection

PALSAR-2 modes for data distribution

F-5-6-7: 28 MHz, 70 km mode

ScanSAR: 350km(14&28 MHz)

Current status of the data processing update

- 1) Sigma-SAR modification and update for the PALSAR-2 processing
- 2) Status: FB is OK in principle except one point below. ScanSAR looks fine but needs tuning (phase tuning might be OK, if not update of reference function)

3) Problems:

1) dual beams (Cause for the azimuth ambiguity) : ScanSAR processing (Dec/Jan End 2014)

2) PRF updates (~7 times per half cycle: Cause for the azimuth ambiguity): Strip and ScanSAR (TBD or DEC. End)

4) Processing load

PALSAR-2 needs 2.5~3 times heavier processing load to the CPU than the PALSAR.>
Reduction of the data processing to each PI is necessary.

5) Solution for azimuth ambiguity: 1)Best phase delay, 2) the azimuth beam distance, 3)
generation of the azimuth reference function, will be tested by the simulation processing. >
Needs one or two months.

Mode	Status	issue
Strip (FB-5-6-7)	OK	PRF change
ScanSAR	Tuning necessary	Dual beam correction

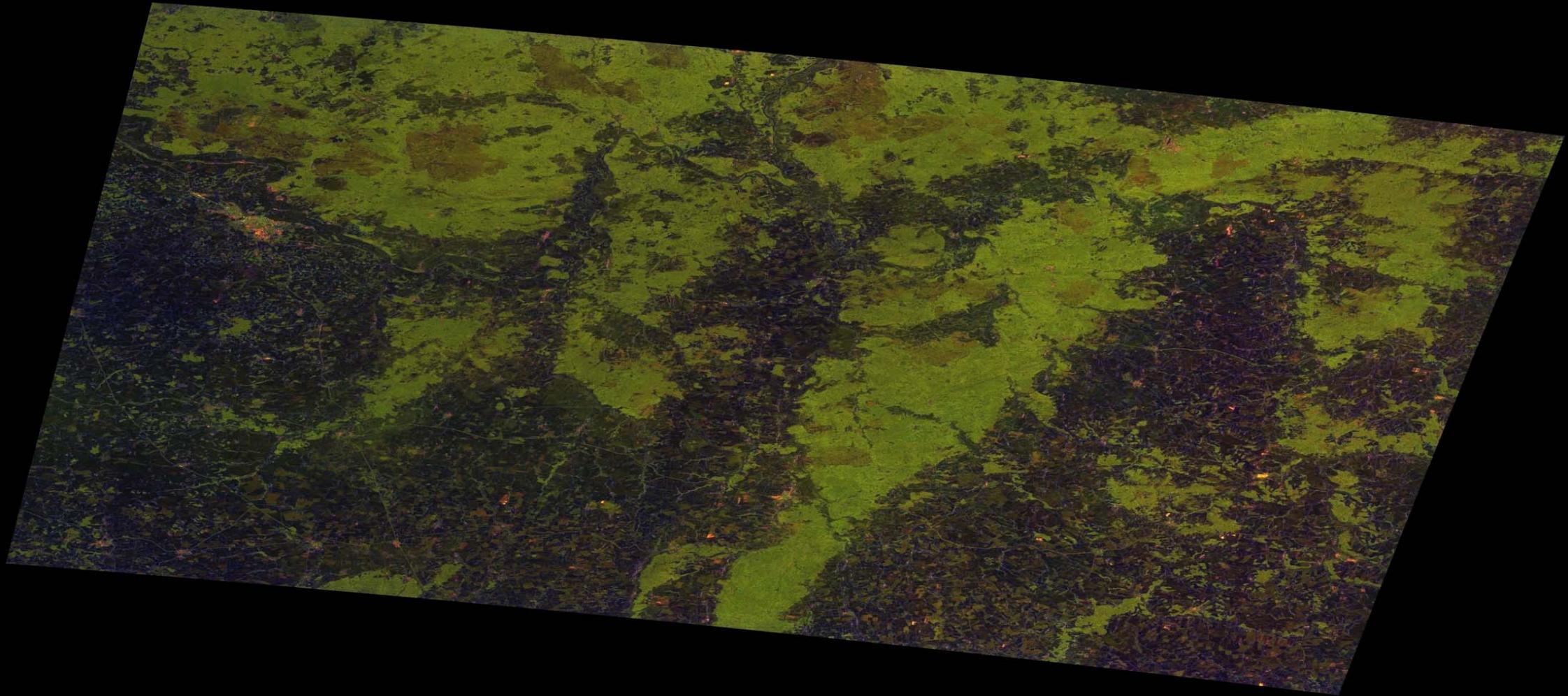
Data Distribution

Hopefully, from the early Feb or March 2015.

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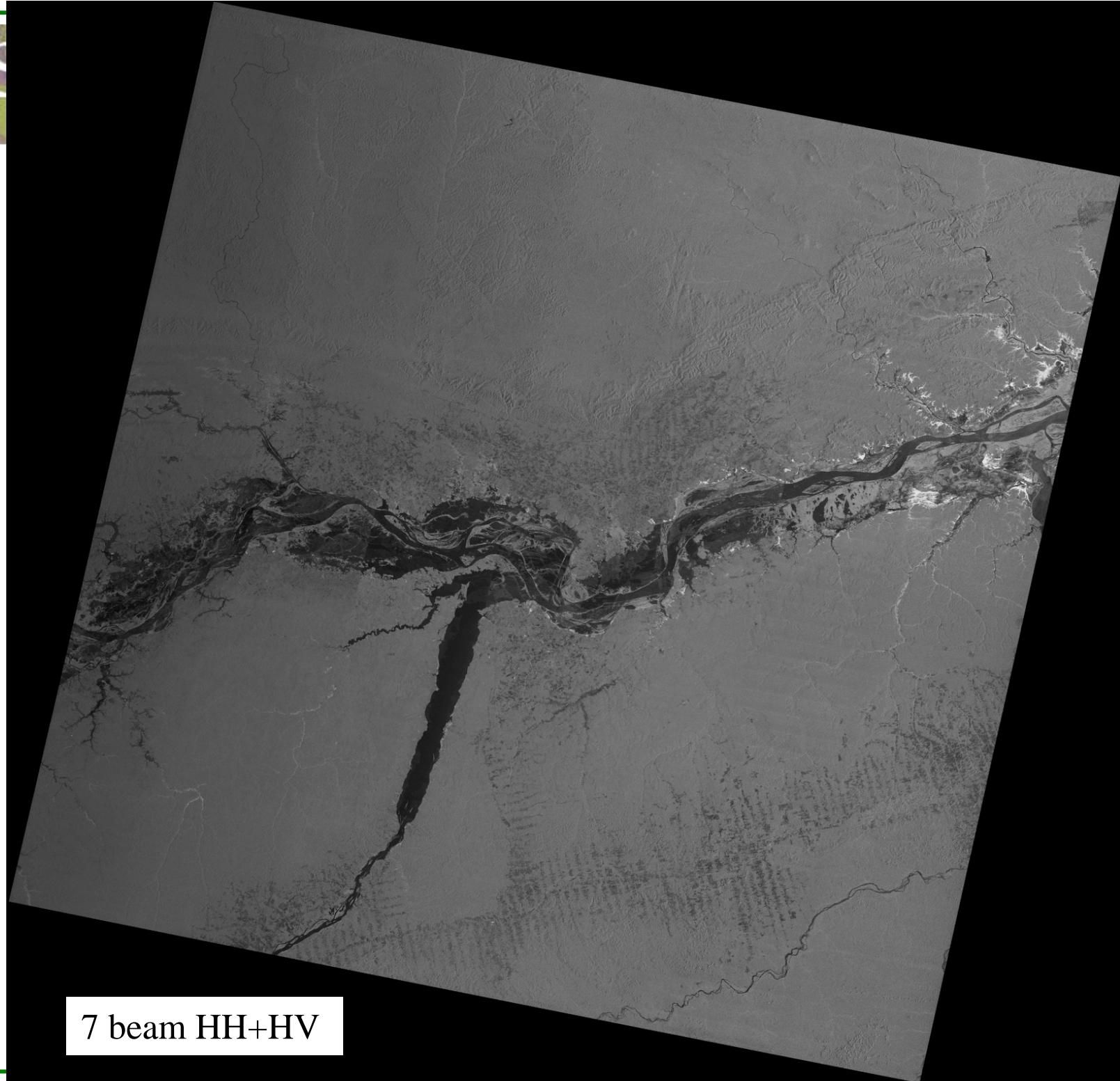
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ScanSAR Russia

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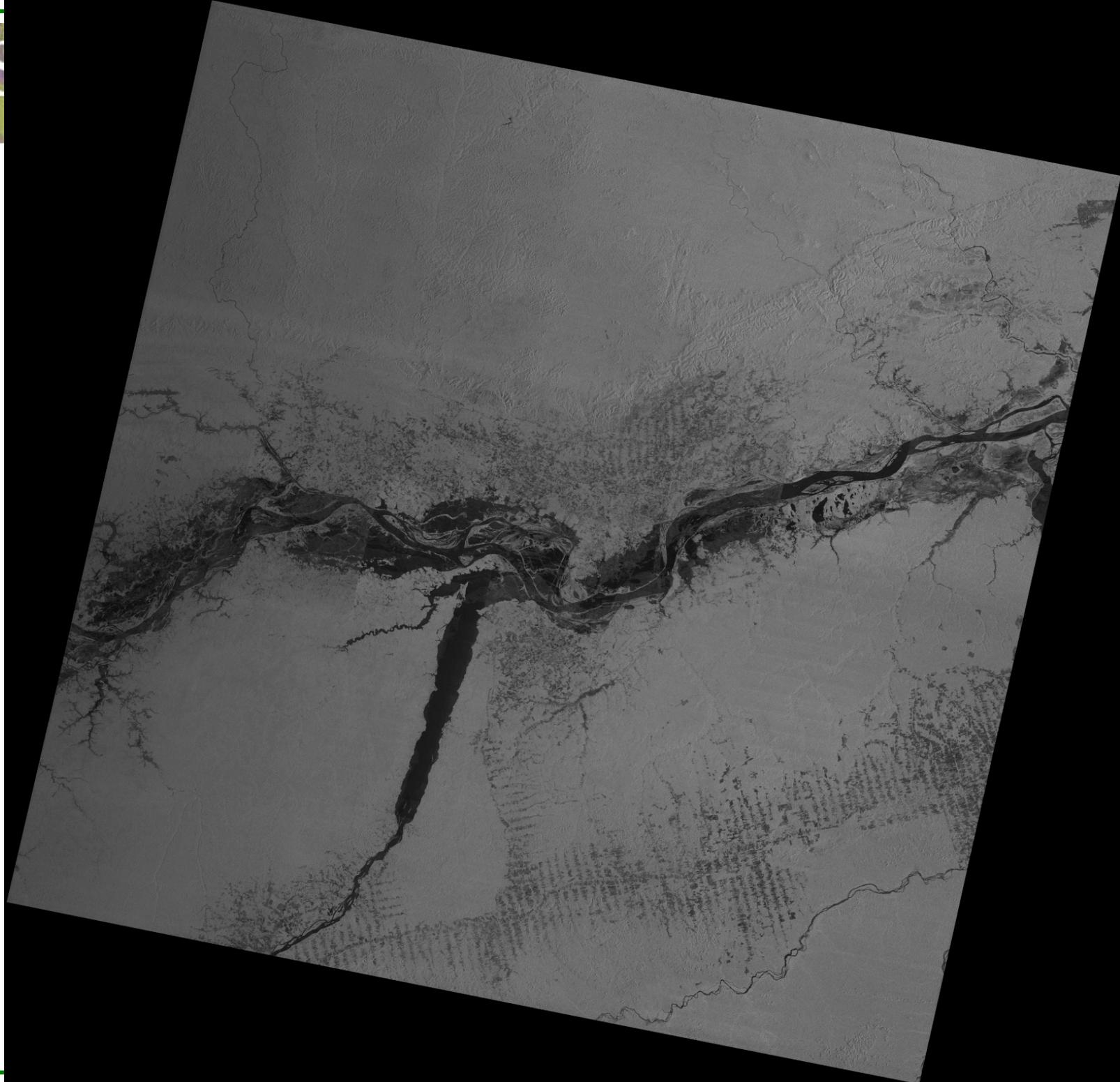
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7 beam HH+HV

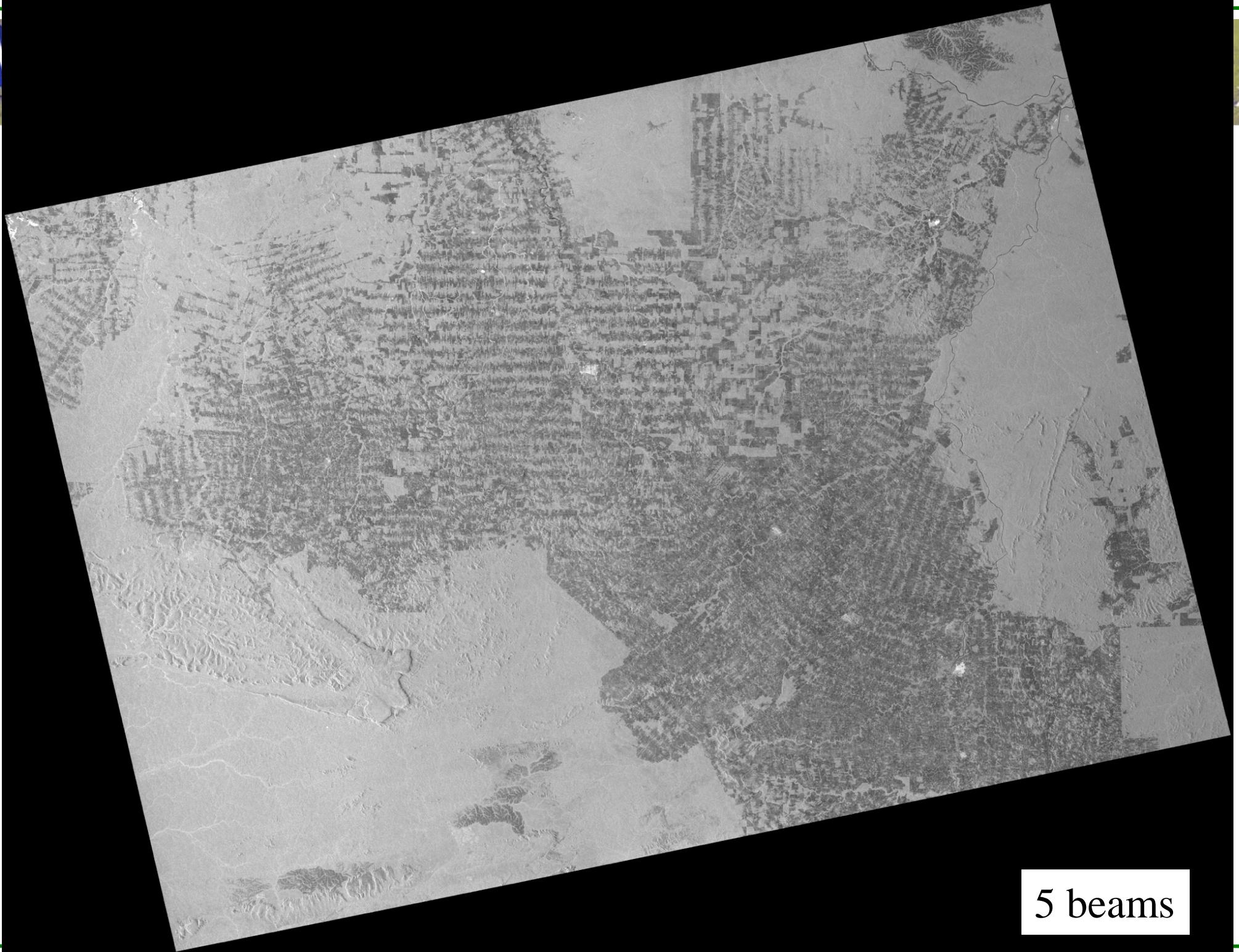
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A

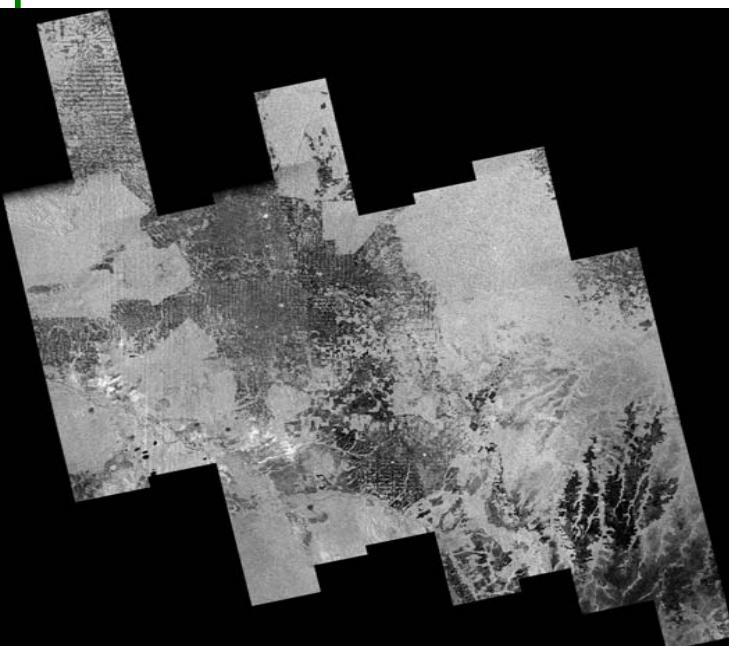
XA



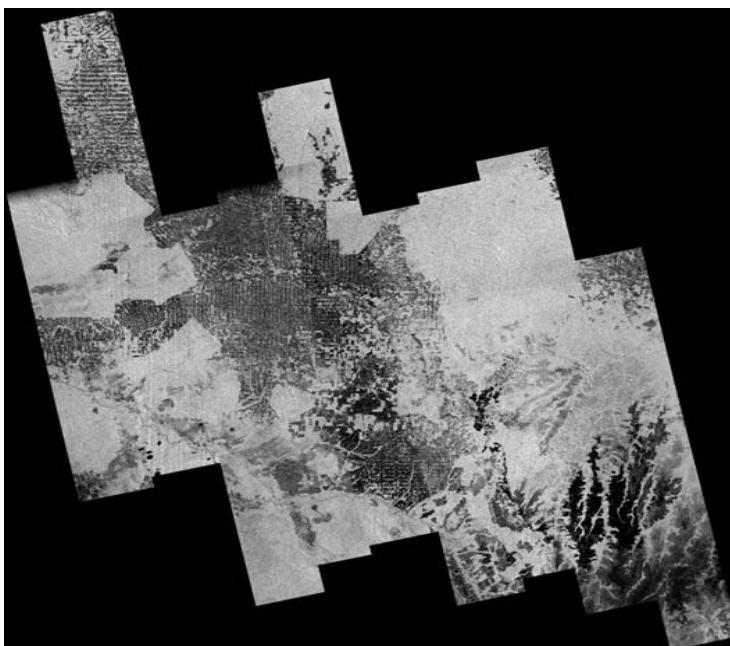
5 beams

4.3.2 25m PALSAR-2 モザイク(Mosaic)

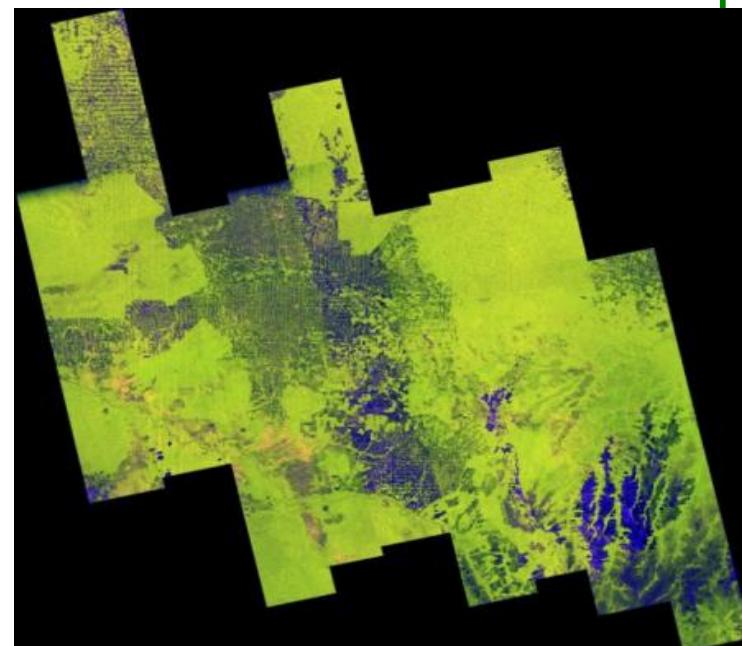
F2-5(Off Nadir: 28.2)/F2-6(Off Nadir: 32.5)/F2-7(Off Nadir: 36.2) の異なる3モードを使用



HH



HV



カラー合成図

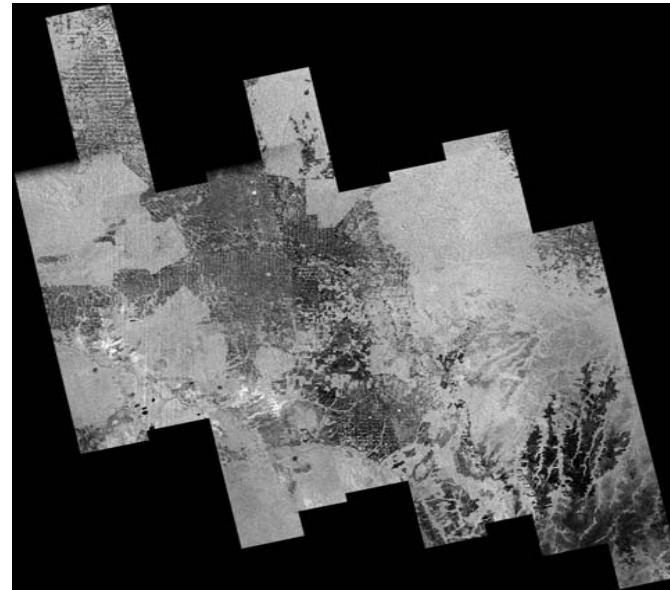
R: HH, G: HV, B: HH/HV

ビームモードの異なる複数パスを位置ズレなく良好に接続

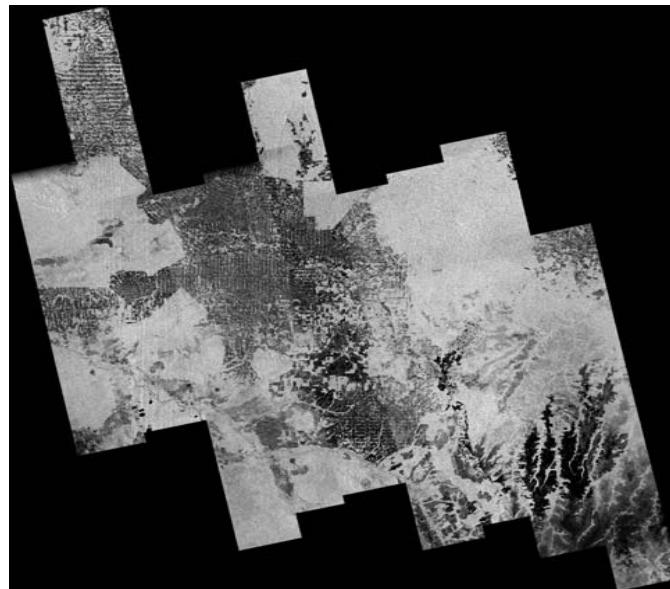
(例は9パス、南米ブラジル・ロンドニア周辺の森林と伐採地を含む領域)

4.3.3 25m PALSAR-2 モザイクによる森林・非森林図(FNF map) generation)

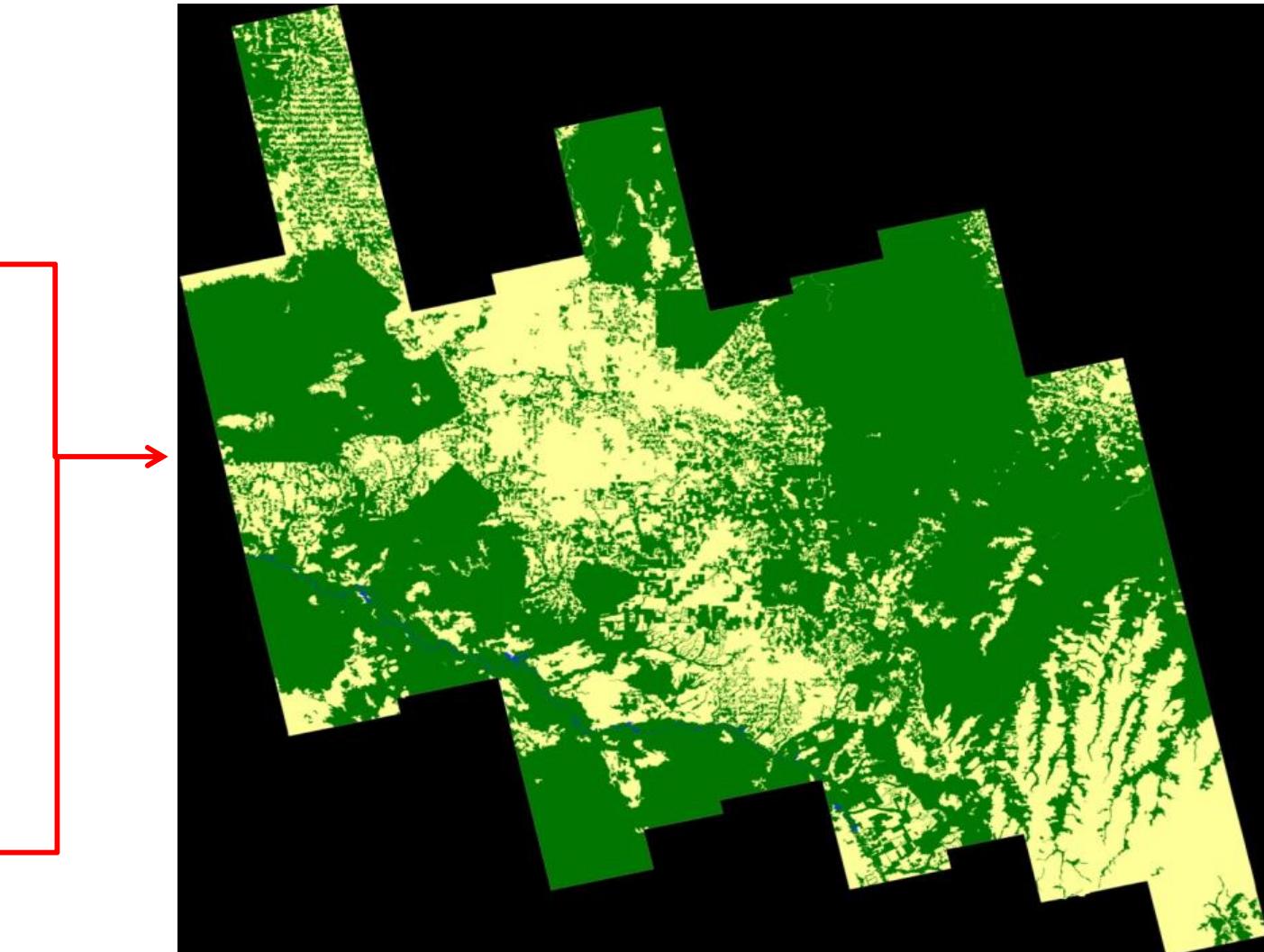
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HH



HV



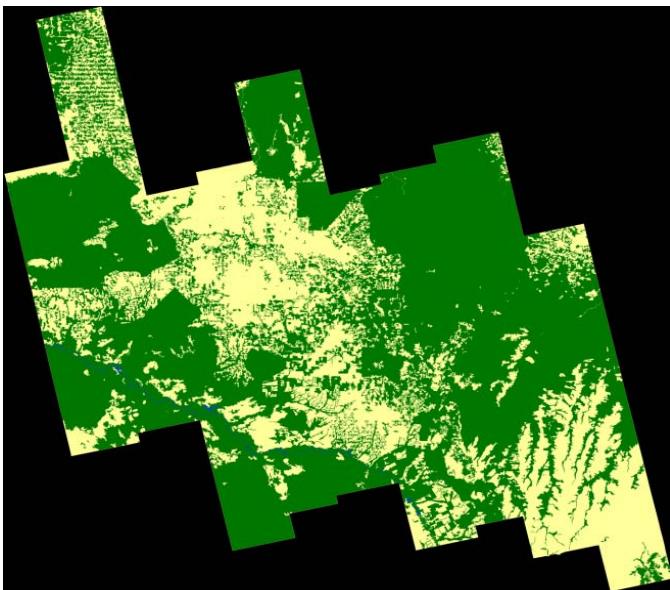
25m PALSAR-2 森林・非森林図 (FNF)

25m PALSAR-2モザイクから森林・非森林の分類により、
森林伐採の状況把握が可能

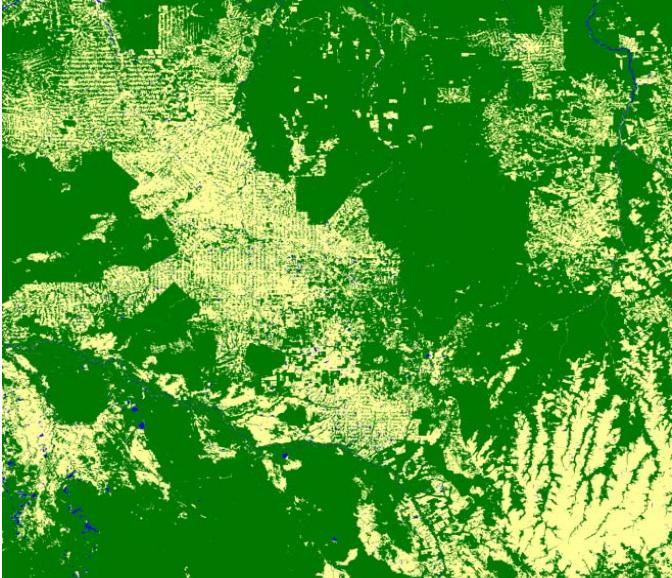
(例は9パス、南米の森林と伐採地を含む領域)

4.3.3 25m PALSAR-2 モザイクによる森林・非森林図(FNF; change detection of the forest area)

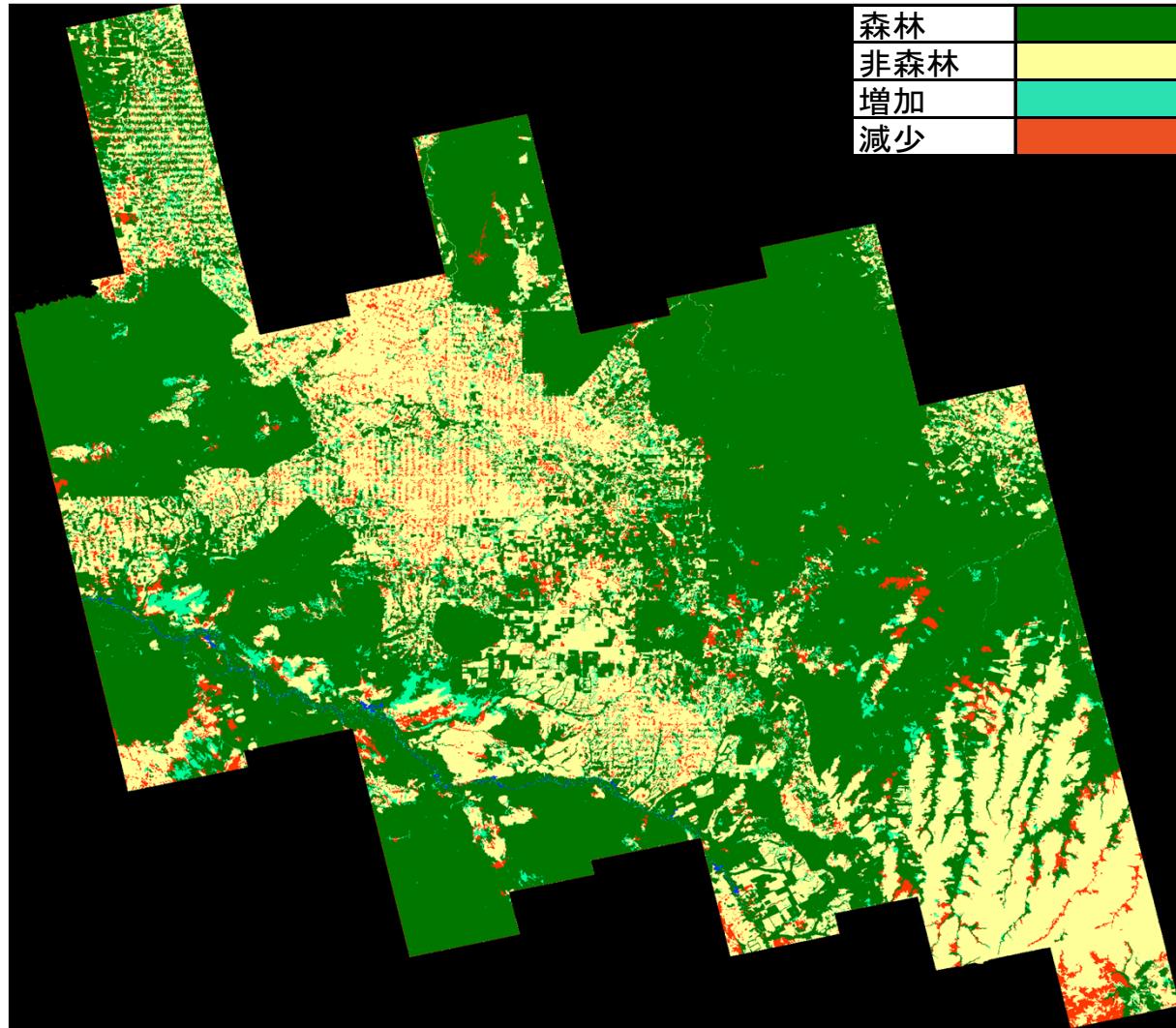
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2014 (PALSAR-2 FNF)



2010 (PALSAR FNF)



2010と2014の比較結果

2010年から2014年の森林面積変化が把握可能
PALSARに比べて分解能の向上, NESZが小さい為に良好な分類が可能になる。

PALSAR/PALSAR-2比較(Comparison) & C Initiative



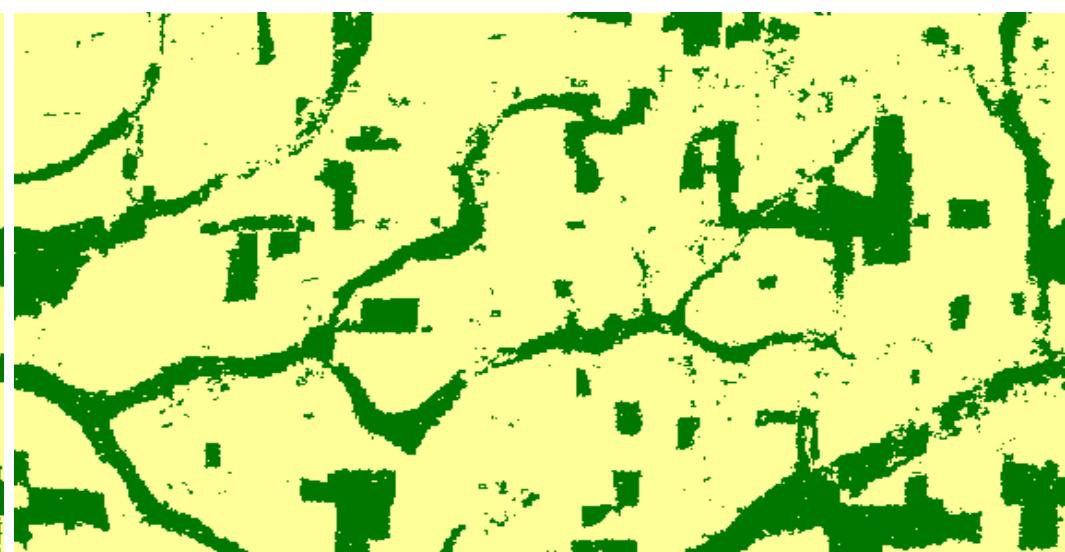
PALSAR FBD HV



PALSAR-2 F2-5 HV



PALSAR FNF (2010)



PALSAR-2 (2014)

PALSAR HVと比較し、PALSAR-2 HVは植生の異なる領域のエッジがはっきりしており、森林・非森林の視認精度が向上した。