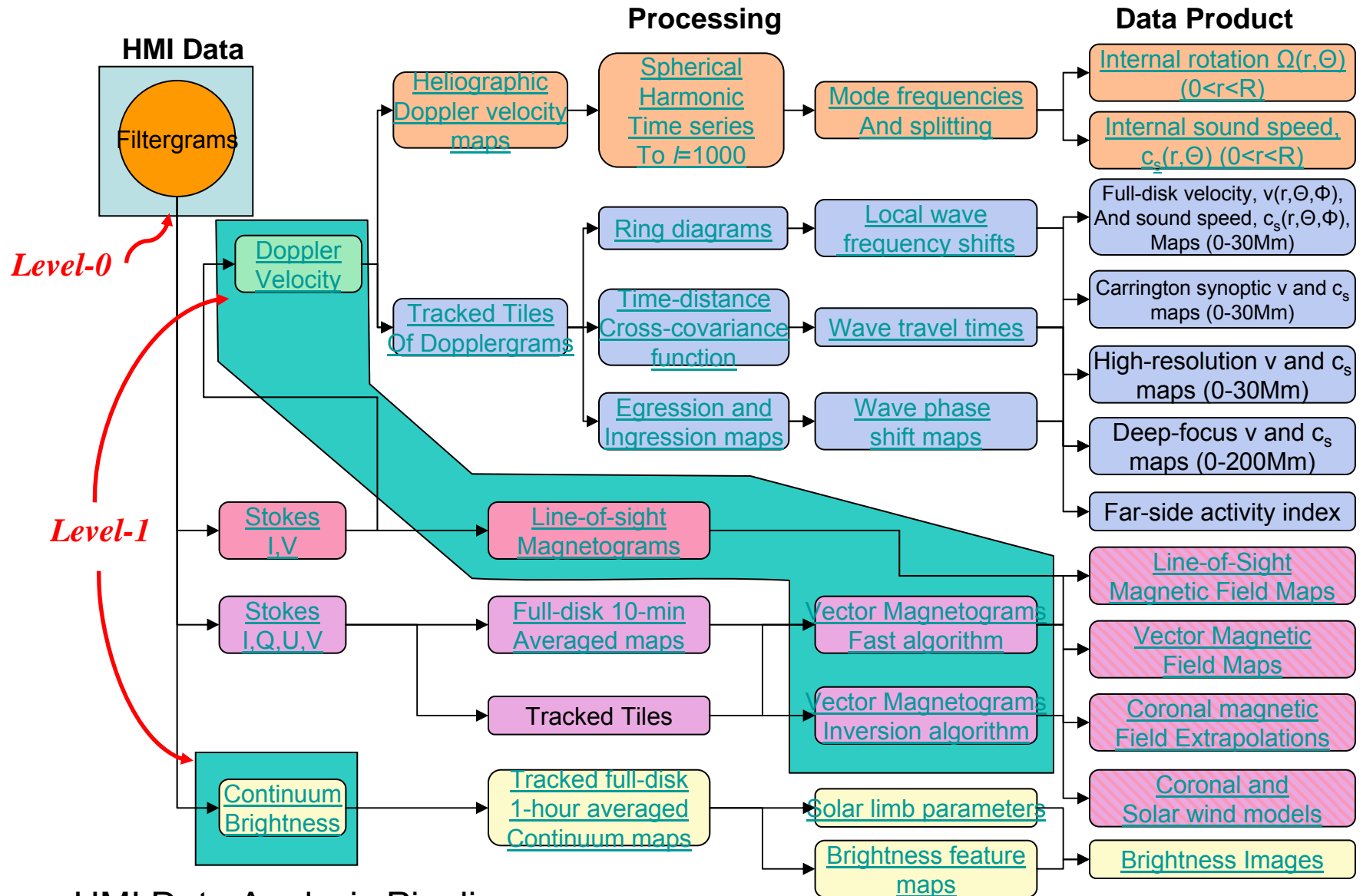


HMI Data Analysis Software

Plan for Phase-D

JSOC - HMI Pipeline



HMI Data Analysis Pipeline

Helioseismology



Doppler Velocity

Heliographic Doppler velocity maps

Tracked Tiles Of Dopplergrams

Spherical Harmonic Time series To $l=1000$

Mode frequencies And splitting

Ring diagrams

Local wave frequency shifts

Time-distance Cross-covariance function

Wave travel times

Egression and Ingression maps

Wave phase shift maps

Internal rotation $\Omega(r, \Theta)$ ($0 < r < R$)

Internal sound speed, $c_s(r, \Theta)$ ($0 < r < R$)

Full-disk velocity, $v(r, \Theta, \Phi)$, And sound speed, $c_s(r, \Theta, \Phi)$, Maps (0-30Mm)

Carrington synoptic v and c_s maps (0-30Mm)

High-resolution v and c_s maps (0-30Mm)

Deep-focus v and c_s maps (0-200Mm)

Far-side activity index

Code: Doppler velocity, Lev1
J.Schou
S.Tomczyk

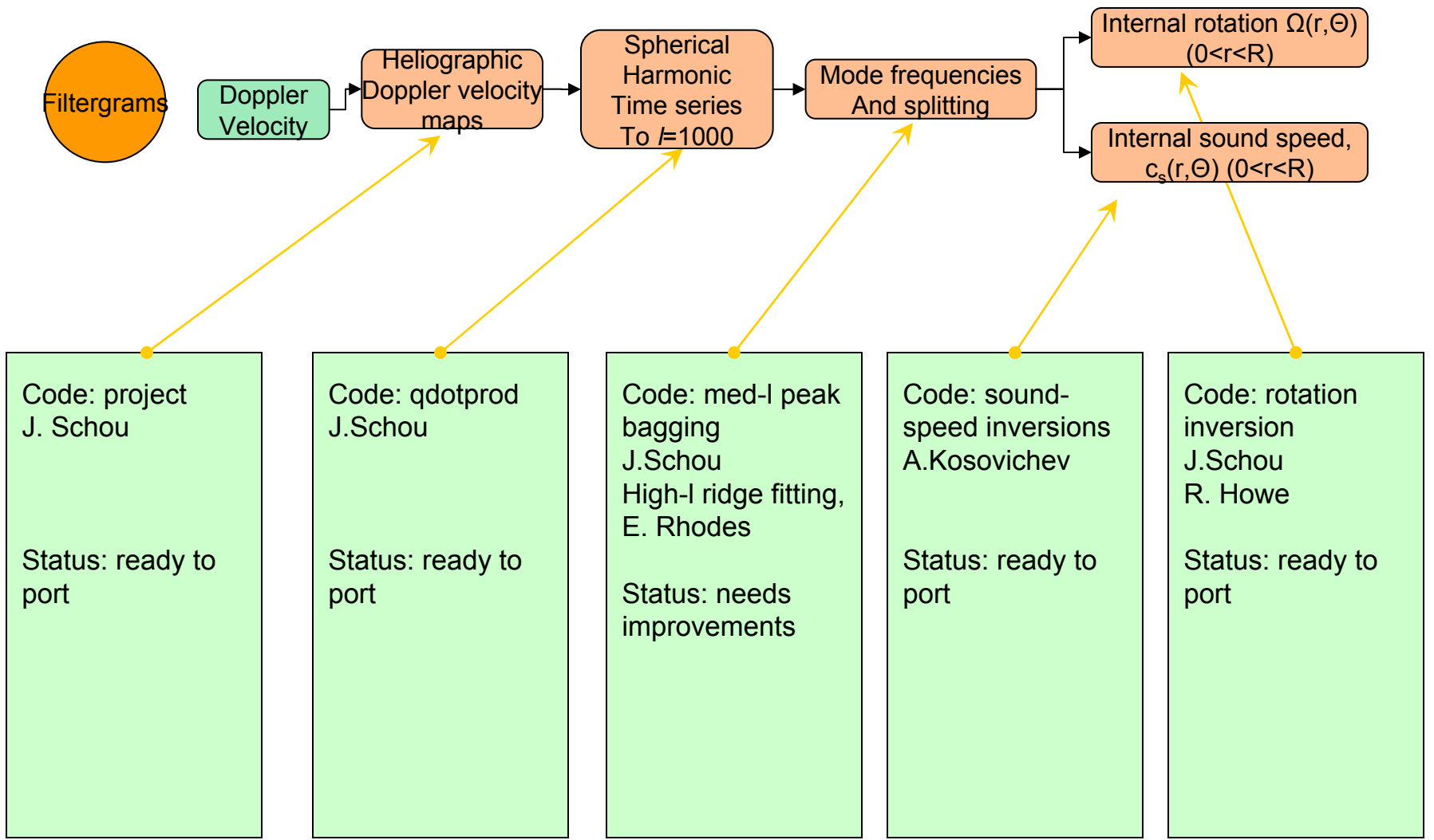
Status: needs improvements

Code: artificial data
N. Mansour
A. Wray
R. Stein

Status: in development

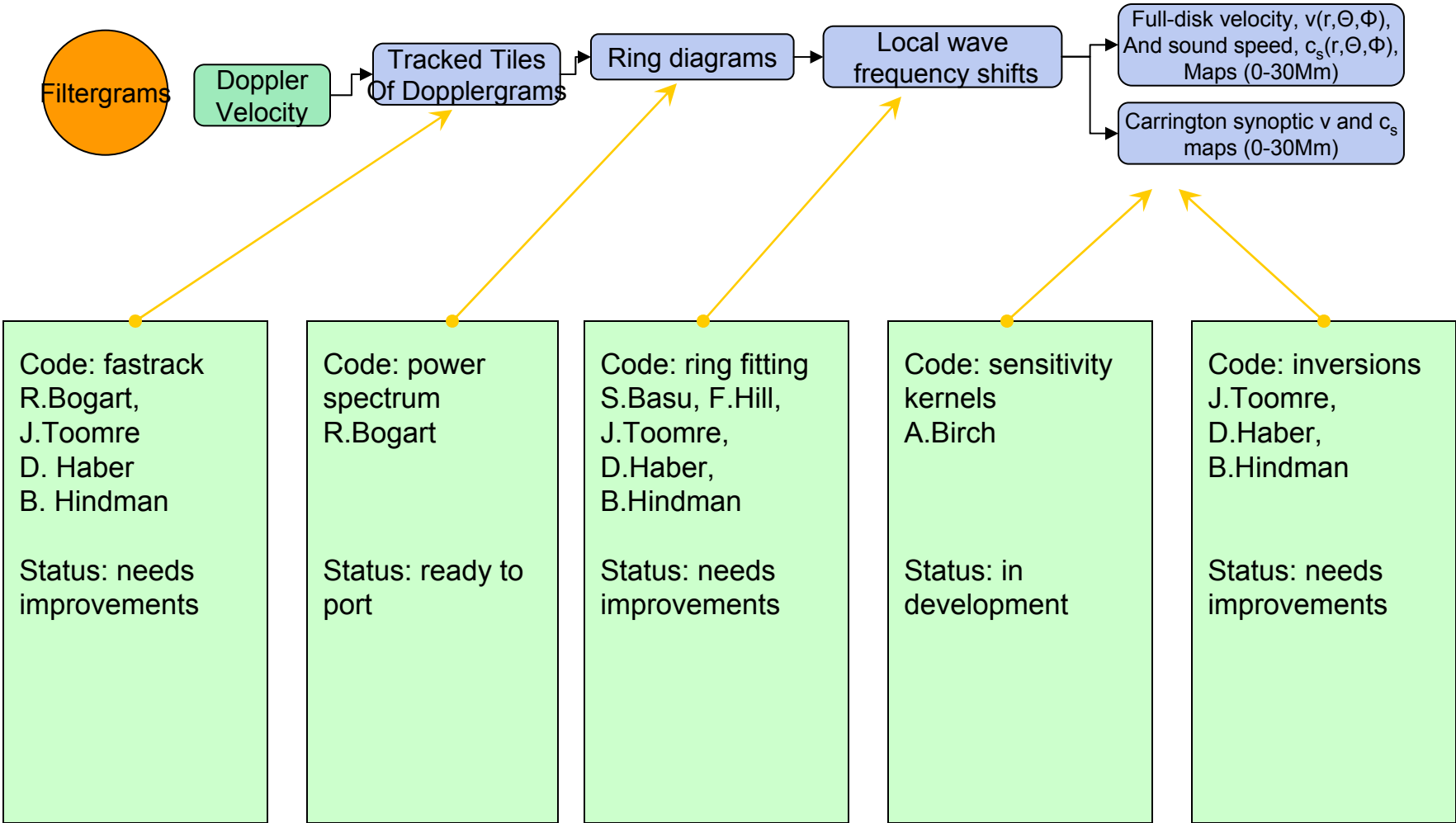
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Global helioseismology



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Ring Diagrams



Time-Distance Helioseismology



Doppler Velocity

Tracked Tiles Of Dopplergrams

Time-distance Cross-covariance function

Wave travel times

Full-disk velocity, $v(r, \theta, \phi)$,
And sound speed, $c_s(r, \theta, \phi)$,
Maps (0-30Mm)

Carrington synoptic v and c_s
maps (0-30Mm)

High-resolution v and c_s
maps (0-30Mm)

Deep-focus v and c_s
maps (0-200Mm)

Code: fastrack
R.Bogart,
T.Duvall
J.Zhao

Status: needs
improvements
(remapping
issues)

Code: cross-
covariance
T.Duvall
J.Zhao

Status: needs
improvements

Code: travel time
fitting
T.Duvall
J.Zhao
S.Couvidat

Status: needs
improvements

Code:
sensitivity
kernels
A.Kosovichev
J.Zhao
A.Birch

Status: needs
improvements

Code: inversions
A.Kosovichev
J.Zhao, A.Birch
S.Couvidat
J.Toomre
B.Hindman

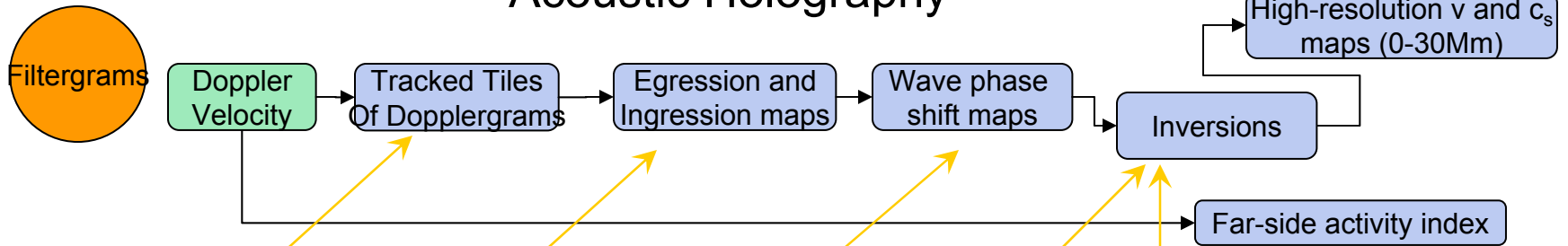
Status: needs
improvements

Code: deep-
focus maps
T.Duvall
A.Kosovichev
J.Zhao

Status: needs
substantial
development

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Acoustic Holography



Code: fastrack
R.Bogart
D.Braun
C.Lindsay

Status: needs improvements
(field-effect corrections)

Code: egression-ingression
D.Braun
C.Lindsay

Status: needs improvements

Code: phase shifts
D.Braun
C.Lindsay

Status: needs improvements
(showglass corrections)

Code: sensitivity kernels
A. Birch

Status: in development

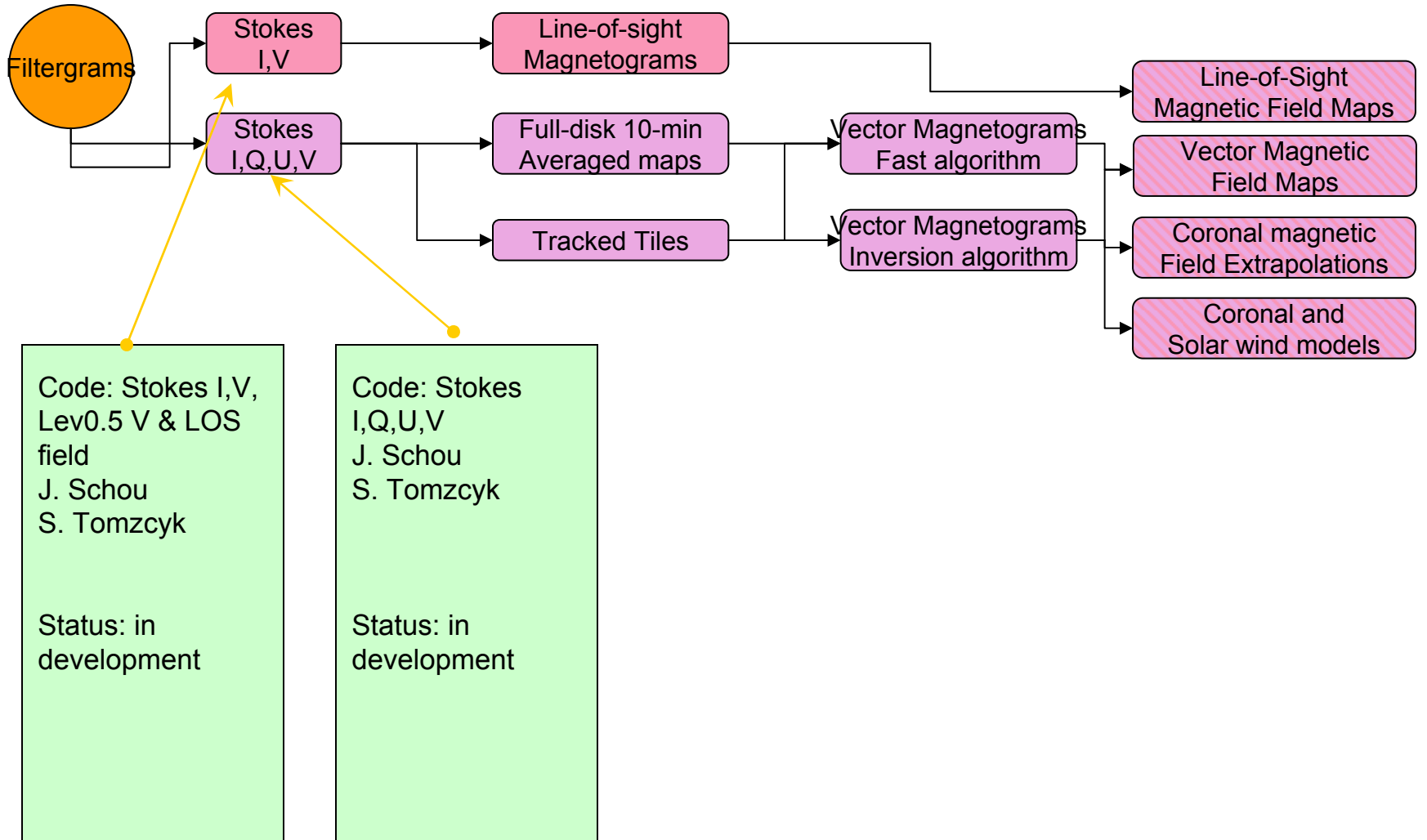
Code: holographic inversions
A.Birch

Status: in development

Code: Far-side imaging
P.Scherrer
C.Lindsay
D.Braun

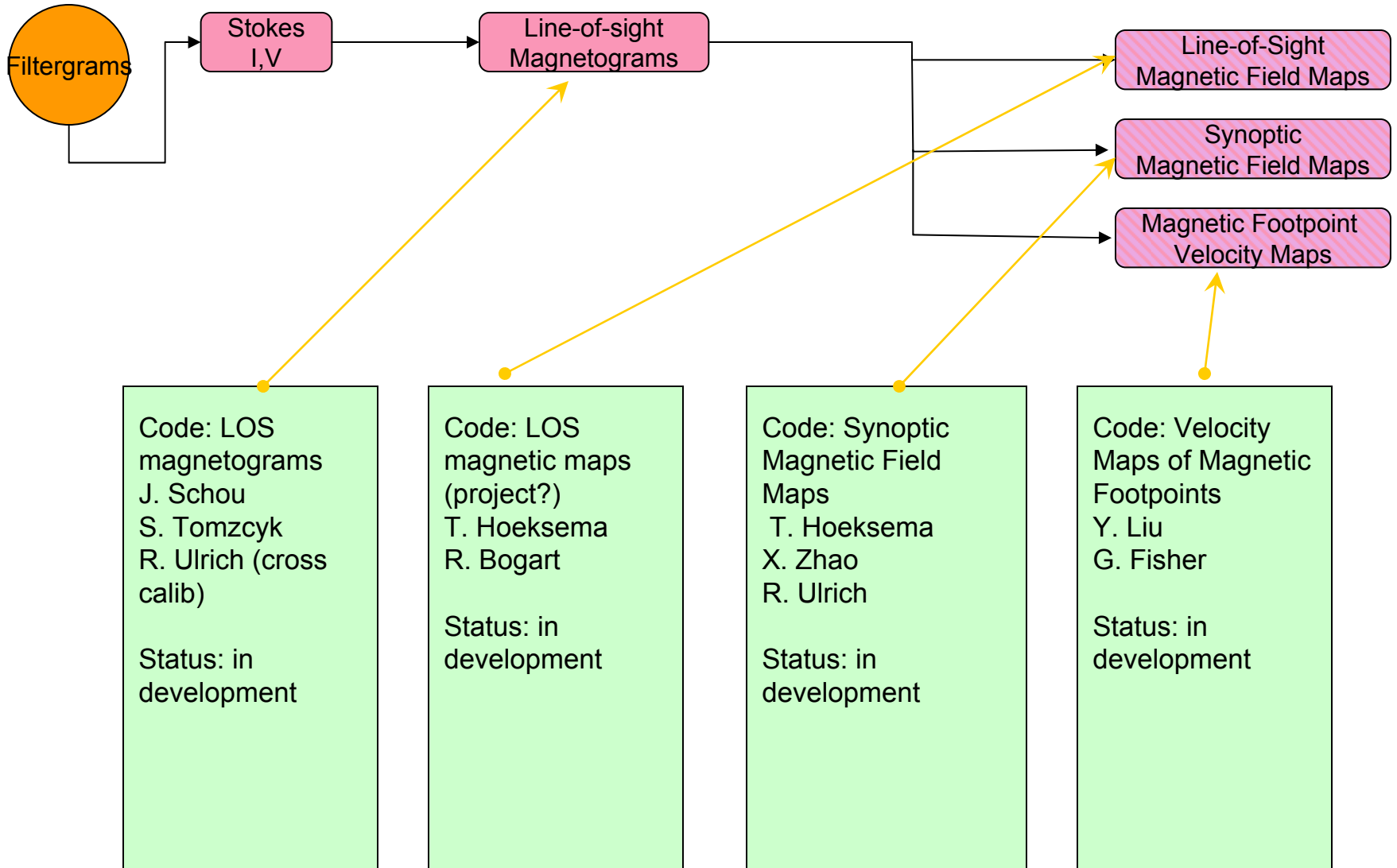
Status: needs improvements

Magnetic Fields



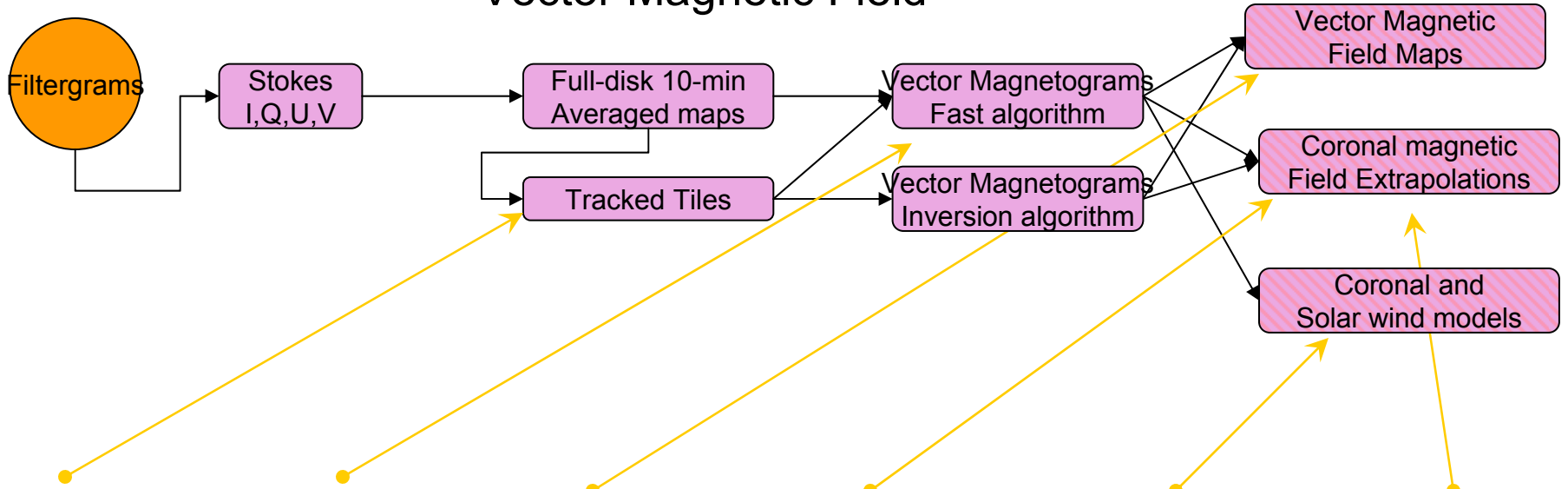
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Line-of Sight Magnetic Field



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Vector Magnetic Field



Code: fastrack
R. Bogart

Status: needs modifications for fields

Code: Vector Field Fast and Inversion Algorithms
J. Schou
S. Tomzcyk

Status: in development

Code: Vector Field Maps
T. Hoeksema
Y.Liu

Status: in development

Code: Coronal Field Extrapolations
T.Hoeksema
Y.Liu, X.Zhao
C. Schrijver
P.Goode T.Metcalf
K.D.Leka

Status: in development

Code: Solar Wind Models
X.Zhao
K.Hayshi
J.Linker
P.Goode
V.Yurchishin

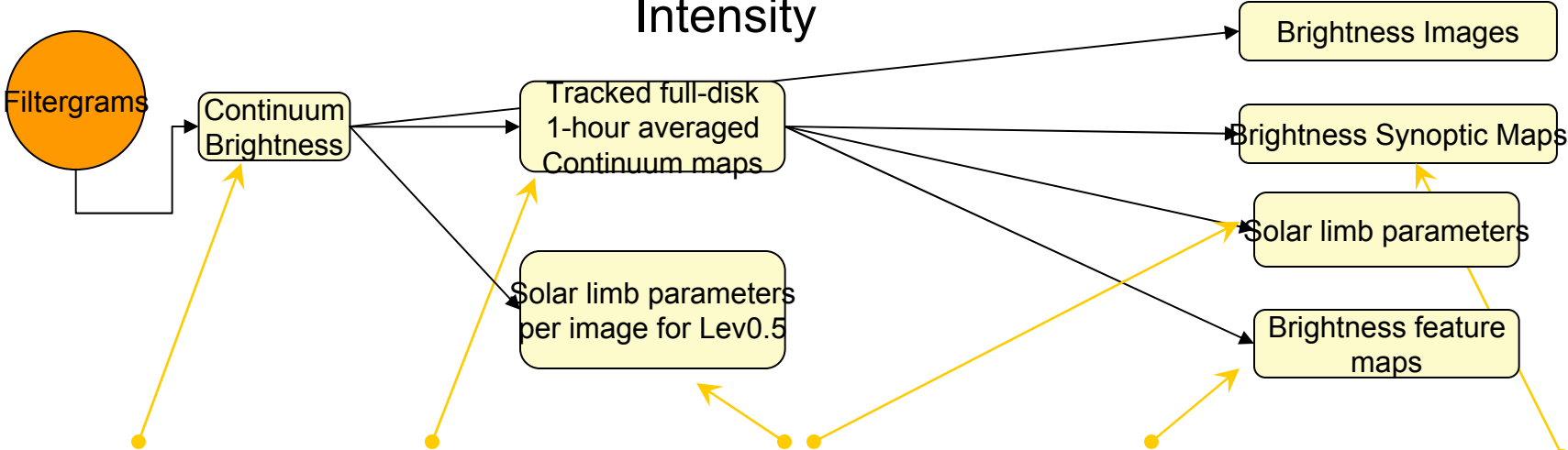
Status: in development

Code: Coronal Magnetic Field Topological Properties
J.Linker
V. Titov

Status: needs implementation

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Intensity



Code: Continuum Maps
Schou

Status: in development

Code: Averaged Continuum Maps
Bush

Status: in development

Code: Solar Limb Parameters,
Lev0.5 used to make other Lev1 products, Lev2 for science goals
R. Bush
J. Kuhn

Status: in development

Code: Brightness Feature Maps
(European contribution)

Status: in development

Code: Brightness Synoptic Maps
Scherrer

Status: in development

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