

HMI	lev0					
Prime	Index	Object	Name	type	note	source
		keyword	ORIGIN	(string)	ORIGIN Location where file made	constant in jsd
		keyword	DATE	(string)	Date_time of processing; ISO 8601	<i>ingest_lev0</i>
		keyword	DATE__OBS	(string)	[DATE-OBS] Date when observation started; ISO 8601	ISP
	x	keyword	T_OBS	(time)	Observation time	ISP
		keyword	EXPTIME	(double)	Exposure duration: mean shutter open time	ISP
		keyword	TIME	(double)	Time of observation: seconds within a day	ISP
		keyword	MJD	(double)	Date of observation: modified julian day	ISP
		keyword	TELESCOP	(string)	For HMI: SDO/HMI	constant in jsd
		keyword	INSTRUME	(string)	For HMI: HMI_SIDE1 or HMI_FRONT2	ISP
		keyword	CAMERA	(int)	For HMI: 1 or 2	ISP
		keyword	WAVELNTH	(float)	For HMI: 617.33 nm	constant in jsd
		keyword	IMGAPID	(int)	Image Application ID	image header
		keyword	IMGFPT	(time)	FIRST_PACKET_TIME	image header
		keyword	BITSELID	(int)	Bit select ID, r	image header
		keyword	COMPID	(int)	Compression ID; n,k	image header
		keyword	CROPID	(int)	Crop table ID	image header
		keyword	DATAVALS	(int)	Actual number of data values in image	<i>ingest_lev0</i>
		keyword	FID	(int)	FID Filtergram ID	image header
x	x	keyword	FSN	(int)	FSN Filtergram Sequence Number	image header
		keyword	LUTID	(int)	Look-up table ID	image header
		keyword	MISSVALS	(int)	Missing values: TOTVALS - DATAVALS	<i>ingest_lev0</i>
		keyword	NERRORS	(int)	Number of decompression errors	<i>ingest_lev0</i>
		keyword	NPACKETS	(int)	Number of packets in image	<i>ingest_lev0</i>
		keyword	QUALLEV0	(int)	Quality word	<i>ingest_lev0</i>
		keyword	TAPCODE	(int)	Take A Picture code	image header
		keyword	TLMDSNAM	(string)	Telemetry data series name with first packet of image	<i>ingest_lev0</i>
		keyword	TOTVALS	(int)	Expected number of data values (pixels)	<i>ingest_lev0</i>
		keyword	DATAMIN	(double)	Minimum value from all pixels	<i>ingest_lev0</i>
		keyword	DATAMAX	(double)	Maximum value from all pixels	<i>ingest_lev0</i>
		keyword	DATAMEDN	(double)	Median value from all pixels	<i>ingest_lev0</i>
		keyword	DATAMEAN	(double)	Mean value for all pixels	<i>ingest_lev0</i>
		keyword	DATARMS	(double)	Rms deviation from the mean value of all pixels	<i>ingest_lev0</i>
		keyword	DATASKEW	(double)	Skewness from the mean value of all pixels	<i>ingest_lev0</i>
		keyword	DATAKURT	(double)	Kurtosis of all pixels	<i>ingest_lev0</i>
		keyword	ISPSNAME	(string)	ISP SERIES NAME	<i>ingest_lev0</i>
		keyword	ISPPKTIM	(time)	PACKET_TIME, Prime key value for the ISP record	ISP
		keyword	ISPPKTVN	(string)	PACKET_VERSION_NUMBER	ISP
		keyword	HSQFGID	(longlong)	HMI_SEQ_FILTERGRAM_ID FID	ISP

	keyword	HSQFGSN	(longlong)	HMI_SEQ_FILTERGRAM_SN FSN	ISP
	keyword	HCAMID	(short)	HMI_SEQ_ID_EXP_PATH	ISP
	keyword	HSHIEXP	(int)	HMI_FSW_IMG_CMDED_EXPOSURE	ISP
	keyword	HCF1ENCD	(int)	HMI_CF1_ENCODER	ISP
	keyword	HCF2ENCD	(int)	HMI_CF2_ENCODER	ISP
	keyword	HCFTID	(int)	HMI_SEQ_ID_FOCUS	ISP
	keyword	HFLID	(int)	HMI_SEQ_ID_FRAMELIST	ISP
	keyword	HFLPSITN	(int)	HMI_SEQ_FRLIST_POS	ISP
	keyword	HFLREFTM	(longlong)	HMI_SEQ_REF_TIM_SEC	ISP
	keyword	HFLRELTM	(int)	HMI_SEQ_FL_REL_TIME	ISP
	keyword	HFTSACID	(int)	HMI_SEQ_FTS_ID_ACTIVE	ISP
	keyword	HFTSCDMK	(longlong)	HMI_SEQ_FTS_CADENCE_MARK	ISP
	keyword	HGP1RGST	(int)	HMI_SEQ_GP1_REGISTER	ISP
	keyword	HGP2RGST	(int)	HMI_SEQ_GP2_REGISTER	ISP
	keyword	HIMGCFID	(int)	HMI_SEQ_ID_IMAGE_CNFG	ISP
	keyword	HWLTNSET	(string)	HMI_IMG_ISS_LOOP	ISP
	keyword	HOBITSEC	(longlong)	HMI_OBT_IMG_TIME_SHM_SEC SHS	ISP
	keyword	HOBITSS	(int)	HMI_OBT_IMG_TIME_SHM_SS SHSS	ISP
	keyword	HOBLSTID	(int)	HMI_SEQ_ID_OBS_LIST	ISP
	keyword	HPLTID	(int)	HMI_SEQ_ID_PST	ISP
	keyword	HPS1ENCD	(int)	HMI_PS1_ENCODER	ISP
	keyword	HPS2ENCD	(int)	HMI_PS2_ENCODER	ISP
	keyword	HPS3ENCD	(int)	HMI_PS3_ENCODER	ISP
	keyword	HSEQERR	(string)	HMI_SEQ_ERROR	ISP
	keyword	HSQEIDX	(int)	HMI_SEQ_EXPOSURE_INDX	ISP
	keyword	HSQFCNT	(int)	HMI_SEQ_FRAME_COUNT	ISP
	keyword	HSQSTATE	(string)	HMI_SEQ_STATE	ISP
	keyword	HWLSTIDX	(int)	HMI_SEQ_WL_SET_INDEX	ISP
	keyword	HWLTID	(int)	HMI_SEQ_ID_WLT	ISP
	keyword	HWT1ENCD	(int)	HMI_WT1_ENCODER	ISP
	keyword	HWT2ENCD	(int)	HMI_WT2_ENCODER	ISP
	keyword	HWT3ENCD	(int)	HMI_WT3_ENCODER	ISP
	keyword	HWT4ENCD	(int)	HMI_WT4_ENCODER	ISP
	keyword	HCF1POS	(int)	HMI_FSW_CF1_CMDED_TARGET	ISP
	keyword	HCF2POS	(int)	HMI_FSW_CF2_CMDED_TARGET	ISP
	keyword	HPL1POS	(int)	HMI_FSW_PS1_CMDED_TARGET	ISP
	keyword	HPL2POS	(int)	HMI_FSW_PS2_CMDED_TARGET	ISP
	keyword	HPL3POS	(int)	HMI_FSW_PS3_CMDED_TARGET	ISP
	keyword	HWL1POS	(int)	HMI_FSW_WT1_CMDED_TARGET	ISP
	keyword	HWL2POS	(int)	HMI_FSW_WT2_CMDED_TARGET	ISP
	keyword	HWL3POS	(int)	HMI_FSW_WT3_CMDED_TARGET	ISP

		keyword	HWL4POS	(int)	HMI_FSW_WT4_CMDED_TARGET	ISP
		keyword	cparms_sg000	(string)		constant in jsd
		keyword	image_bzero	(double)		constant in jsd
		keyword	image_bscale	(double)		constant in jsd
		keyword	cparms_sg001	(string)		constant in jsd
		keyword	image_sm_bzero	(double)		constant in jsd
		keyword	image_sm_bscale	(double)		constant in jsd
		segment	image	fits	lev0 data fits file	image data
		segment	image_sm	fits	lev0 data small fits file with headers	<i>ingest_lev0</i>
		segment	image_png	generic	lev0 data sm image	<i>ingest_lev0</i>

HMI	lev0.3, lev0.5					
Prime	Index	Object	Name	type	note	source
0	0	keylink	ORIGIN	(string)	ORIGIN Location where file made	lev0 record
0	0	keyword	DATE	(string)	Date_time of processing; ISO 8601	make lev0.3, lev0.5 programs
0	0	keylink	DATE__OBS	(string)	[DATE-OBS] Date when observation started; ISO 8601	lev0 record
0	x	keylink	T_OBS	(time)	Observation time	lev0 record
0	0	keylink	EXPTIME	(double)	Exposure duration: mean shutter open time	lev0 record
0	0	keylink	TIME	(double)	Time of observation: seconds within a day	lev0 record
0	0	keylink	MJD	(double)	Date of observation: modified julian day	lev0 record
0	0	keylink	TELESCOP	(string)	For HMI: SDO/HMI	lev0 record
0	0	keylink	INSTRUME	(string)	For HMI: HMI_SIDE1 or HMI_FRONT2	lev0 record
0	0	keylink	CAMERA	(int)	For HMI: 1 or 2	lev0 record
0	0	keylink	WAVELNTH	(float)	For HMI: 617.33 nm	lev0 record
0	0	keylink	IMGAPID	(int)	Image Application ID	lev0 record
0	0	keylink	IMGFPT	(time)	FIRST_PACKET_TIME	lev0 record
0	0	keylink	BITSELID	(int)	Bit select ID, r	lev0 record
0	0	keylink	COMPID	(int)	Compression ID; n,k	lev0 record
0	0	keylink	CROPID	(int)	Crop table ID	lev0 record
0	0	keylink	DATAVALS	(int)	Actual number of data values in image	lev0 record
0	0	keylink	FID	(int)	FID Filtergram ID	lev0 record
x	x	keylink	FSN	(int)	FSN Filtergram Sequence Number	lev0 record
0	0	keylink	LUTID	(int)	Look-up table ID	lev0 record
0	0	keylink	MISSVALS	(int)	Missing values: TOTVALS - DATAVALS	lev0 record
0	0	keylink	NERRORS	(int)	Number of decompression errors	lev0 record
0	0	keylink	NPACKETS	(int)	Number of packets in image	lev0 record
0	0	keylink	QUALLEV0	(int)	Quality word	lev0 record
0	0	keylink	TAPCODE	(int)	Take A Picture code	lev0 record
0	0	keylink	TLMDSNAM	(string)	Telemetry data series name with first packet of image	lev0 record
0	0	keylink	TOTVALS	(int)	Expected number of data values (pixels)	lev0 record
0	0	keylink	DATAMIN	(double)	Minimum value from all pixels	lev0 record
0	0	keylink	DATAMAX	(double)	Maximum value from all pixels	lev0 record
0	0	keylink	DATAMEDN	(double)	Median value from all pixels	lev0 record
0	0	keylink	DATAMEAN	(double)	Mean value for all pixels	lev0 record
0	0	keylink	DATARMS	(double)	Rms deviation from the mean value of all pixels	lev0 record
0	0	keylink	DATASKEW	(double)	Skewness from the mean value of all pixels	lev0 record
0	0	keylink	DATAKURT	(double)	Kurtosis of all pixels	lev0 record

0	0	keylink	ISPSNAME	(string)	ISP SERIES NAME	lev0 record
0	0	keylink	ISPPKTIM	(time)	PACKET_TIME, Prime key value for the ISP record	lev0 record
0	0	keylink	ISPPKTVN	(string)	PACKET_VERSION_NUMBER	lev0 record
0	0	keylink	HSQFGID	(longlong)	HMI_SEQ_FILTERGRAM_ID FID	lev0 record
0	0	keylink	HSQFGSN	(longlong)	HMI_SEQ_FILTERGRAM_SN FSN	lev0 record
0	0	keylink	HCAMID	(short)	HMI_SEQ_ID_EXP_PATH	lev0 record
0	0	keylink	HSHIEXP	(int)	HMI_FSW_IMG_CMDED_EXPOSURE	lev0 record
0	0	keylink	HCF1ENCD	(int)	HMI_CF1_ENCODER	lev0 record
0	0	keylink	HCF2ENCD	(int)	HMI_CF2_ENCODER	lev0 record
0	0	keylink	HCFTID	(int)	HMI_SEQ_ID_FOCUS	lev0 record
0	0	keylink	HFLID	(int)	HMI_SEQ_ID_FRAMELIST	lev0 record
0	0	keylink	HFLPSITN	(int)	HMI_SEQ_FRLIST_POS	lev0 record
0	0	keylink	HFLREFTM	(longlong)	HMI_SEQ_REF_TIM_SEC	lev0 record
0	0	keylink	HFLRELTM	(int)	HMI_SEQ_FL_REL_TIME	lev0 record
0	0	keylink	HFTSACID	(int)	HMI_SEQ_FTS_ID_ACTIVE	lev0 record
0	0	keylink	HFTSCDMK	(longlong)	HMI_SEQ_FTS_CADENCE_MARK	lev0 record
0	0	keylink	HGP1RGST	(int)	HMI_SEQ_GP1_REGISTER	lev0 record
0	0	keylink	HGP2RGST	(int)	HMI_SEQ_GP2_REGISTER	lev0 record
0	0	keylink	HIMGCFID	(int)	HMI_SEQ_ID_IMAGE_CNFG	lev0 record
0	0	keylink	HWLTNSET	(string)	HMI_IMG_ISS_LOOP	lev0 record
0	0	keylink	HOBITSEC	(longlong)	HMI_OBT_IMG_TIME_SHM_SEC SHS	lev0 record
0	0	keylink	HOBITSS	(int)	HMI_OBT_IMG_TIME_SHM_SS SHSS	lev0 record
0	0	keylink	HOBLSTID	(int)	HMI_SEQ_ID_OBS_LIST	lev0 record
0	0	keylink	HPLTID	(int)	HMI_SEQ_ID_PST	lev0 record
0	0	keylink	HPS1ENCD	(int)	HMI_PS1_ENCODER	lev0 record
0	0	keylink	HPS2ENCD	(int)	HMI_PS2_ENCODER	lev0 record
0	0	keylink	HPS3ENCD	(int)	HMI_PS3_ENCODER	lev0 record
0	0	keylink	HSEQERR	(string)	HMI_SEQ_ERROR	lev0 record
0	0	keylink	HSQEIDX	(int)	HMI_SEQ_EXPOSURE_INDX	lev0 record
0	0	keylink	HSQFCNT	(int)	HMI_SEQ_FRAME_COUNT	lev0 record
0	0	keylink	HSQSTATE	(string)	HMI_SEQ_STATE	lev0 record
0	0	keylink	HWLSTIDX	(int)	HMI_SEQ_WL_SET_INDEX	lev0 record
0	0	keylink	HWLTID	(int)	HMI_SEQ_ID_WLT	lev0 record
0	0	keylink	HWT1ENCD	(int)	HMI_WT1_ENCODER	lev0 record
0	0	keylink	HWT2ENCD	(int)	HMI_WT2_ENCODER	lev0 record
0	0	keylink	HWT3ENCD	(int)	HMI_WT3_ENCODER	lev0 record
0	0	keylink	HWT4ENCD	(int)	HMI_WT4_ENCODER	lev0 record

0	0	keylink	HCF1POS	(int)	HMI_FSW_CF1_CMDED_TARGET	lev0 record
0	0	keylink	HCF2POS	(int)	HMI_FSW_CF2_CMDED_TARGET	lev0 record
0	0	keylink	HPL1POS	(int)	HMI_FSW_PS1_CMDED_TARGET	lev0 record
0	0	keylink	HPL2POS	(int)	HMI_FSW_PS2_CMDED_TARGET	lev0 record
0	0	keylink	HPL3POS	(int)	HMI_FSW_PS3_CMDED_TARGET	lev0 record
0	0	keylink	HWL1POS	(int)	HMI_FSW_WT1_CMDED_TARGET	lev0 record
0	0	keylink	HWL2POS	(int)	HMI_FSW_WT2_CMDED_TARGET	lev0 record
0	0	keylink	HWL3POS	(int)	HMI_FSW_WT3_CMDED_TARGET	lev0 record
0	0	keylink	HWL4POS	(int)	HMI_FSW_WT4_CMDED_TARGET	lev0 record
0	0	keylink	cparms_sg000	(string)		0 lev0
0	0	keylink	image_bzero	(double)		0 lev0
0	0	keylink	image_bscale	(double)		0 lev0
0	0	keylink	cparms_sg001	(string)		0 lev0
0	0	keylink	image_sm_bzero	(double)		0 lev0
0	0	keylink	image_sm_bscale	(double)		0 lev0
		keyword	INST_ROT	(float)	Static roll offset	from some table by date range
		keyword	SAT_ROT	(float)	SDO roll, generate from ASP	SDO ASP
		keyword	DSUN_OBS	(float)	Distance to Sun center from SDO in meters	SDO FDS
		keyword	CRLN_OBS	(float)	Carrington longitude of SDO	SDO FDS
		keyword	CRLT_OBS	(float)	Carrington latitude of SDO	SDO FDS
		keyword	HGLN_OBS	(float)	Stonyhurst longitude of SDO (Earth is at 0.0)	SDO FDS
		keyword	CAR_ROT	(int)	Carrington rotation of CRLN_OBS	SDO FDS
		keyword	CTYPE1	(string)	"HPLN-TAN"	SDO FDS
		keyword	CTYPE2	(string)	"HPLT-TAN"	SDO FDS
		keyword	CRPIX1	(float)	CCD column address of Sun center, leftmost pixel center = 1	SDO ASP, same as MDI X0+1
		keyword	CRPIX2	(float)	CCD row address of Sun center, bottom pixel center = 1	SDO ASP, same as MDI X0+1
		keyword	CRVAL1	(float)	Location on Sun of CRPIX, == 0.0	constant in jsd
		keyword	CRVAL2	(float)	Location on Sun of CRPIX, == 0.0	constant in jsd
		keyword	CDEL1	(float)	nominal plate scale in arc-sec, = 0.5	from some table, for this level
		keyword	CDEL2	(float)	nominal plate scale in arc-sec, = 0.5	from some table, for this level
		keyword	CUNIT1	(float)	"arcsec"	constant in jsd
		keyword	CUNIT2	(float)	"arcsec"	constant in jsd
		keyword	CROTA1	(float)	negative of solar position angle on CCD	lev0.3, lev0.5 program = INST_R
		keyword	CROTA2	(float)	negative of solar position angle on CCD	lev0.3, lev0.5 program = INST_R
		keyword	XCEN	(float)	position west on Sun of array center in arcsec	lev0.3, lev0.5 program, see doc.
		keyword	YCEN	(float)	position north on Sun of array center in arcsec	lev0.3, lev0.5 program, see doc.
		keyword	IM_SCALE	(float)	plate scale at CCD	from some table, does not change
		keyword	OBS_VR	(float)	speed of SDO away from Sun, m/s	SDO FDS
		keyword	OBS_VW	(float)	speed of SDO in direction of increasing HGLN_OBS	SDO FDS
		keyword	OBS_VN	(float)	speed of SDO in direction of increasing HGLT_OBS	SDO FDS



HMI	Level 1.0					
Prime	Index	Object	Name	type	note	source
0	0	keylink	ORIGIN	(string)	ORIGIN Location where file made	lev0.3, lev0.5 record
0	0	keyword	DATE	(string)	Date_time of processing; ISO 8601	make level1 program
0	0	keylink	DATE_OBS	(string)	[DATE-OBS] Date when observation started; ISO 8601	lev0.3, lev0.5 record
0	x	keylink	T_OBS	(time)	Observation time	lev0.3, lev0.5 record
0	0	keylink	EXPTIME	(double)	Exposure duration: mean shutter open time	lev0.3, lev0.5 record
0	0	keylink	TIME	(double)	Time of observation: seconds within a day	lev0.3, lev0.5 record
0	0	keylink	MJD	(double)	Date of observation: modified julian day	lev0.3, lev0.5 record
0	0	keylink	TELESCOP	(string)	For HMI: SDO/HMI	lev0.3, lev0.5 record
0	0	keylink	INSTRUME	(string)	For HMI: HMI_SIDE1 or HMI_FRONT2	lev0.3, lev0.5 record
0	0	keylink	CAMERA	(int)	For HMI: 1 or 2	lev0.3, lev0.5 record
0	0	keylink	WAVELNTH	(float)	For HMI: 617.33 nm	lev0.3, lev0.5 record
0	0	keylink	IMGAPID	(int)	Image Application ID	lev0.3, lev0.5 record
0	0	keylink	IMGFPT	(time)	FIRST_PACKET_TIME	lev0.3, lev0.5 record
0	0	keylink	BITSELID	(int)	Bit select ID, r	lev0.3, lev0.5 record
0	0	keylink	COMPID	(int)	Compression ID; n,k	lev0.3, lev0.5 record
0	0	keylink	CROPID	(int)	Crop table ID	lev0.3, lev0.5 record
0	0	keylink	DATAVALS	(int)	Actual number of data values in image	level1.0 program
0	0	keylink	FID	(int)	FID Filtergram ID	lev0.3, lev0.5 record
x	x	keylink	FSN	(int)	FSN Filtergram Sequence Number	lev0.3, lev0.5 record
0	0	keylink	LUTID	(int)	Look-up table ID	lev0.3, lev0.5 record
0	0	keylink	MISSVALS	(int)	Missing values: TOTVALS - DATAVALS	level1.0 program
0	0	keylink	NERRORS	(int)	Number of decompression errors	lev0.3, lev0.5 record
0	0	keylink	NPACKETS	(int)	Number of packets in image	lev0.3, lev0.5 record
0	0	keylink	QUALLEV0	(int)	Quality word	lev0.3, lev0.5 record
0	0	keylink	TAPCODE	(int)	Take A Picture code	lev0.3, lev0.5 record
0	0	keylink	TLMDSNAM	(string)	Telemetry data series name with first packet of image	lev0.3, lev0.5 record
0	0	keylink	TOTVALS	(int)	Expected number of data values (pixels)	lev0.3, lev0.5 record
0	0	keylink	DATAMIN	(double)	Minimum value from all pixels	level1.0 program
0	0	keylink	DATAMAX	(double)	Maximum value from all pixels	level1.0 program
0	0	keylink	DATAMEDN	(double)	Median value from all pixels	level1.0 program
0	0	keylink	DATAMEAN	(double)	Mean value for all pixels	level1.0 program
0	0	keylink	DATARMS	(double)	Rms deviation from the mean value of all pixels	level1.0 program
0	0	keylink	DATASKEW	(double)	Skewness from the mean value of all pixels	level1.0 program
0	0	keylink	DATAKURT	(double)	Kurtosis of all pixels	level1.0 program



0	0	keylink	ISPSNAME	(string)	ISP SERIES NAME	lev0.3, lev0.5 record
0	0	keylink	ISPPKTIM	(time)	PACKET_TIME, Prime key value for the ISP record	lev0.3, lev0.5 record
0	0	keylink	ISPPKTVN	(string)	PACKET_VERSION_NUMBER	lev0.3, lev0.5 record
0	0	keylink	HSQFGID	(longlong)	HMI_SEQ_FILTERGRAM_ID FID	lev0.3, lev0.5 record
0	0	keylink	HSQFGSN	(longlong)	HMI_SEQ_FILTERGRAM_SN FSN	lev0.3, lev0.5 record
0	0	keylink	HCAMID	(short)	HMI_SEQ_ID_EXP_PATH	lev0.3, lev0.5 record
0	0	keylink	HSHIEXP	(int)	HMI_FSW_IMG_CMDED_EXPOSURE	lev0.3, lev0.5 record
0	0	keylink	HCF1ENCD	(int)	HMI_CF1_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HCF2ENCD	(int)	HMI_CF2_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HCFTID	(int)	HMI_SEQ_ID_FOCUS	lev0.3, lev0.5 record
0	0	keylink	HFLID	(int)	HMI_SEQ_ID_FRAMELIST	lev0.3, lev0.5 record
0	0	keylink	HFLPSITN	(int)	HMI_SEQ_FRLIST_POS	lev0.3, lev0.5 record
0	0	keylink	HFLREFTM	(longlong)	HMI_SEQ_REF_TIM_SEC	lev0.3, lev0.5 record
0	0	keylink	HFLRELTM	(int)	HMI_SEQ_FL_REL_TIME	lev0.3, lev0.5 record
0	0	keylink	HFTSACID	(int)	HMI_SEQ_FTS_ID_ACTIVE	lev0.3, lev0.5 record
0	0	keylink	HFTSCDMK	(longlong)	HMI_SEQ_FTS_CADENCE_MARK	lev0.3, lev0.5 record
0	0	keylink	HGP1RGST	(int)	HMI_SEQ_GP1_REGISTER	lev0.3, lev0.5 record
0	0	keylink	HGP2RGST	(int)	HMI_SEQ_GP2_REGISTER	lev0.3, lev0.5 record
0	0	keylink	HIMGCFID	(int)	HMI_SEQ_ID_IMAGE_CNFG	lev0.3, lev0.5 record
0	0	keylink	HWLTNSET	(string)	HMI_IMG_ISS_LOOP	lev0.3, lev0.5 record
0	0	keylink	HOBITSEC	(longlong)	HMI_OBT_IMG_TIME_SHM_SEC SHS	lev0.3, lev0.5 record
0	0	keylink	HOBITSS	(int)	HMI_OBT_IMG_TIME_SHM_SS SHSS	lev0.3, lev0.5 record
0	0	keylink	HOBLSTID	(int)	HMI_SEQ_ID_OBS_LIST	lev0.3, lev0.5 record
0	0	keylink	HPLTID	(int)	HMI_SEQ_ID_PST	lev0.3, lev0.5 record
0	0	keylink	HPS1ENCD	(int)	HMI_PS1_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HPS2ENCD	(int)	HMI_PS2_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HPS3ENCD	(int)	HMI_PS3_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HSEQERR	(string)	HMI_SEQ_ERROR	lev0.3, lev0.5 record
0	0	keylink	HSQEIDX	(int)	HMI_SEQ_EXPOSURE_INDX	lev0.3, lev0.5 record
0	0	keylink	HSQFCNT	(int)	HMI_SEQ_FRAME_COUNT	lev0.3, lev0.5 record
0	0	keylink	HSQSTATE	(string)	HMI_SEQ_STATE	lev0.3, lev0.5 record
0	0	keylink	HWLSTIDX	(int)	HMI_SEQ_WL_SET_INDEX	lev0.3, lev0.5 record
0	0	keylink	HWLTID	(int)	HMI_SEQ_ID_WLT	lev0.3, lev0.5 record
0	0	keylink	HWT1ENCD	(int)	HMI_WT1_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HWT2ENCD	(int)	HMI_WT2_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HWT3ENCD	(int)	HMI_WT3_ENCODER	lev0.3, lev0.5 record
0	0	keylink	HWT4ENCD	(int)	HMI_WT4_ENCODER	lev0.3, lev0.5 record

0	0	keylink	HCF1POS	(int)	HMI_FSW_CF1_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HCF2POS	(int)	HMI_FSW_CF2_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HPL1POS	(int)	HMI_FSW_PS1_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HPL2POS	(int)	HMI_FSW_PS2_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HPL3POS	(int)	HMI_FSW_PS3_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HWL1POS	(int)	HMI_FSW_WT1_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HWL2POS	(int)	HMI_FSW_WT2_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HWL3POS	(int)	HMI_FSW_WT3_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	HWL4POS	(int)	HMI_FSW_WT4_CMDED_TARGET	lev0.3, lev0.5 record
0	0	keylink	cparms_sg000	(string)		0 lev0.3, lev0.5 record
0	0	keyword	image_bzero	(double)		0 level1.0 program
0	0	keyword	image_bscale	(double)		0 level1.0 program
0	0	keyword	cparms_sg001	(string)		0 level1.0 program
0	0	keyword	image_sm_bzero	(double)		0 level1.0 program
0	0	keyword	image_sm_bscale	(double)		0 level1.0 program
0	0	keylink	INST_ROT	(float)	Static roll offset	lev0.3, lev0.5 record
0	0	keylink	SAT_ROT	(float)	SDO roll, generate from ASP	lev0.3, lev0.5 record
0	0	keylink	DSUN_OBS	(float)	Distance to Sun center from SDO in meters	lev0.3, lev0.5 record
0	0	keylink	CRLN_OBS	(float)	Carrington longitude of SDO	lev0.3, lev0.5 record
0	0	keylink	CRLT_OBS	(float)	Carrington latitude of SDO	lev0.3, lev0.5 record
0	0	keylink	HGLN_OBS	(float)	Stonyhurst longitude of SDO (Earth is at 0.0)	lev0.3, lev0.5 record
0	0	keylink	CAR_ROT	(int)	Carrington rotation of CRLN_OBS	lev0.3, lev0.5 record
0	0	keylink	CTYPE1	(string)	"HPLN-TAN"	lev0.3, lev0.5 record
0	0	keylink	CTYPE2	(string)	"HPLT-TAN"	lev0.3, lev0.5 record
0	0	keyword	CRPIX1	(float)	CCD column address of Sun center, leftmost pixel center = 1	level1.0 program
0	0	keyword	CRPIX2	(float)	CCD row address of Sun center, bottom pixel center = 1	level1.0 program
0	0	keylink	CRVAL1	(float)	Location on Sun of CRPIX, == 0.0	lev0.3, lev0.5 record
0	0	keylink	CRVAL2	(float)	Location on Sun of CRPIX, == 0.0	lev0.3, lev0.5 record
0	0	keylink	CDEL1	(float)	nominal plate scale in arc-sec, = 0.5	level1.0 program
0	0	keylink	CDEL2	(float)	nominal plate scale in arc-sec, = 0.5	level1.0 program
0	0	keylink	CUNIT1	(float)	"arcsec"	lev0.3, lev0.5 record
0	0	keylink	CUNIT2	(float)	"arcsec"	lev0.3, lev0.5 record
0	0	keylink	CROTA1	(float)	negative of solar position angle on CCD	lev0.3, lev0.5 record
0	0	keylink	CROTA2	(float)	negative of solar position angle on CCD	lev0.3, lev0.5 record
0	0	keylink	XCEN	(float)	position west on Sun of array center in arcsec	level1.0 program
0	0	keylink	YCEN	(float)	position north on Sun of array center in arcsec	level1.0 program
0	0	keylink	IM_SCALE	(float)	plate scale at CCD	lev0.3, lev0.5 record
0	0	keylink	OBS_VR	(float)	speed of SDO away from Sun, m/s	lev0.3, lev0.5 record
0	0	keylink	OBS_VW	(float)	speed of SDO in direction of increasing HGLN_OBS	lev0.3, lev0.5 record
0	0	keylink	OBS_VN	(float)	speed of SDO in direction of increasing HGLT_OBS	lev0.3, lev0.5 record

0	0	keylink	0	0	0	lev0.3, lev0.5 record
0	0	keylink	0	0	0	lev0.3, lev0.5 record
0	0	keylink	0	0	0	lev0.3, lev0.5 record
0	0	keylink	0	0	0	lev0.3, lev0.5 record
0	0	keylink	0	0	0	lev0.3, lev0.5 record
0	0	keylink	0	0	0	lev0.3, lev0.5 record
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		segment	image	fits	level 1.0 image data	level1.0 program
		segment	badpixels	tbd	bad pixel mask or list	level1.0 program
		seglink	image	fits	lev0 data fits file	lev0.3, lev0.5 record
		seglink	image_sm	fits	lev0 data small fits file with headers	lev0.3, lev0.5 record
		seglink	image_png	generic	lev0 data sm image	lev0.3, lev0.5 record
		link	lev0	dynamic	link to lev0 record by FSN	lev0.3, lev0.5 record
		link	fineflatfield	static	link to fine scale flat field record used	level1.0 program
		link	flatfield	static	link to flat field record used	level1.0 program
		link	lev0.5	???	link to lev0.3/0.5 record (maybe same?)	level1.0 program

Notes on level1.0 processing

level1.0 in various forms, quicklook, provisional, and final operates on the lev0 images to
1. Apply full CCD large scale flat field
2. Find center of images with framelist types that correspond to science data
3. Apply fine scale flat field to iamges with framelist types that correspond to science data
4. generate and store bad pixel information as either a list of pixels, a start-stop list, or a mask or an image quality map (if multiple reasons to drop
The product of lev1.0 is ready for consumption by lev1.5 code.
Perhaps the various level1 products can be in the same series with overrides on retention, archive, record deletion on retention runout, etc on a per-
Notes on keywords:
Coordinate keywords updated include CRPIX, CDELTA based on limb fit; statistics set based on flat fields, etc.