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% SPM batch manual    -    spm_bch.man
%
% Distributed with SPM99, but modified by Matt Budde for use in BIW.
% Only steps used in that presentation are shown. 5/22/01
%
%-----
%                                     BATCH_DOCUMENTATION
%-----
% @(#)spm_bch.man 2.6 JB Poline & Stephanie Rouquette 99/10/27
%
%-----
%                                     [VARIABLE_DESCRIPTION]
%-----
% [UNIQUE]           : refers to the fields that take a unique value,
%                   such that length(variable(Nth).field) == 1
% [MULTIPLE]        : refers to the field that have length >= 1
%                   NB : the fields under the [MULTIPLE] section should have
%                   the SAME length
%-----
%                                     [VARIABLE_TYPE_DESCRIPTION]
%-----
% INDICES           : These are used for the [INDEXING_SYSTEM]
%                   in general should be valid indices to a child var.
% VALUE             : a single value, eg 1.7
% INTEGER           : an integer value
% INTEGER_ARRAY     : an array of integers (eg [ 1 1 1 ])
% STRING            : a string
% STRINGS           : cell array of strings, like {'aa','bb',...}
% STRING_ARRAY      : array of strings : ['file001.img';'file001.img';...]
%                   (like the output of spm_get)
% STRING_ARRAYS     : cell array of STRING_ARRAY
% VALUE_ARRAY       : array of values, eg [1.2 6 12 432]
% VALUE_ARRAYS      : cell array of VALUE_ARRAY
% ARRAY             : a matrix
%
%=====
% [ANALYSES]
%=====
%
% analyses : STRUCT % [ANALYSES]
%-----
%.....[MULTIPLE].....
% 'type',      INDICES
% 'index',     INDICES
% 'mfile',     INDICES
% 'work_dir',  INDICES
%-----
%-----
% type = STRINGS % [TYPE]
%-----
%-----
% work_dir = STRINGS % [WORK_DIR]
%-----
%-----
% mfile = STRINGS % [MFILE]
%-----
%

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%=====
% [REALIGN]  -> [SESSIONS]
%=====
%-----
% realign : STRUCT % [REALIGN]
%-----
%.....[UNIQUE].....
% 'subject_nb',    INTEGER
% 'num_sessions',  INTEGER
% 'option'
%     1 <-> 'Coregister only'
%     2 <-> 'Reslice Only'
%     3 <-> 'Coregister & Reslice'
% 'modality'
%     1 <-> 'EPI MR images'
%     2 <-> 'PET images'
%     3 <-> 'T1 MR images'
%     4 <-> 'T2 MR images'
%     5 <-> 'Transm images'
% 'reslice_method'
%     1  <-> 'Trilinear Interpolation'
%     -9 <-> 'Sinc Interpolation'
%     Inf <-> 'Fourier space Interpolation'
% 'create'
%     1 <-> 'All Images (1..n)'
%     2 <-> 'Images 2..n'
%     3 <-> 'All Images + Mean Image'
%     4 <-> 'Mean Image Only'
% 'mask', 'yes|no', [1 0]
% 'adjust_sampling_errors', 'yes|no', [1 0]
%
%.....[MULTIPLE].....
% 'sessions',    INDICES
%
%-----
% sessions : STRUCT % [SESSIONS]
%-----
% 'images', {STRING_ARRAYS},
%
%-----
%

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%=====
% [COREG]
%=====
%-----
% coreg : STRUCT % [COREG]
%-----
%.....[UNIQUE].....
% 'subject_nb',    INTEGER
% 'opt',
%     1 <-> 'Coregister only'
%     2 <-> 'Reslice Only'
%     3 <-> 'Coregister & Reslice'
% 'target_mod'
%     1 <-> 'Target - PET'
%     2 <-> 'Target - T1 MRI'
%     3 <-> 'Target - T2 MRI'
%     4 <-> 'Target - PD MRI'
%     5 <-> 'Target - EPI'
%     6 <-> 'Target - Transm'
%     7 <-> 'Target - SPECT'
% 'object_mod'
%     1 <-> 'Object - PET'
%     2 <-> 'Object - T1 MRI'
%     3 <-> 'Object - T2 MRI'
%     4 <-> 'Object - PD MRI'
%     5 <-> 'Object - EPI'
%     6 <-> 'Object - Transm'
%     7 <-> 'Object - SPECT'
%
%.....[MULTIPLE].....
%
% 'target_image',  STRING_ARRAY
% 'object_image',  STRING_ARRAY
% 'other_image',   STRING_ARRAYS
%
%-----
%=====
% [SMOOTH]
%=====
%-----
% smooth : STRUCT % [SMOOTH]
%-----
%.....[UNIQUE].....
% 'FWHMmm',        INTEGER ARRAY
% 'files',         STRING ARRAY
%
%-----
%
%
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%=====
% [NORMALIZE]
%=====
%-----
% normalize : STRUCT % [NORMALIZE]
%-----
%.....[UNIQUE].....
% 'option'
%         1 <-> 'Determine Parameters Only'
%         2 <-> 'Write Normalised Only'
%         3 <-> 'Determine Parameters & Write Normalised'
% 'nsubjects', INTEGER
% 'object_masking', 'yes|no', [1 0]
% 'template', STRING
% 'type'
%     0 <-> 'Default Normalisation'
%     1 <-> 'Custom Normalisation'
% 'nonlin_func_nb'
%     0:14 <-> 'Custom|none|2x2x2|2x3x2|3x3x3|3x4x3|4x4x4|4x5x4|...
%           5x5x5|5x6x5|6x6x6|6x7x6|7x7x7|7x8x7|8x8x8'
% 'func_nb', INTEGER
% 'nonlin_ite_nb', INTEGER ([1 3 5 8 12 16])
% 'nonlin_regular'
%     [1 0.1 0.01 0.001 0.0001] <-> 'Extremely Heavy regularization|...
%     Heavy regularization|Medium regularization|Light regularization|...
%     Very Light regularization'
% 'mask_brain', 'yes|no', [1 0],
% 'interp'
%     0 <-> 'Nearest Neighbour'
%     1 <-> 'Bilinear Interpolation'
%     -9 <-> 'Sinc Interpolation (9x9x9)'
% 'bounding_box'
%     0 <-> 'Customise'
%     1 <-> '-78:78 -112:76 -50:85 (Default)'
%     2 <-> '-64:64 -104:68 -28:72 (SPM95)'
%     3 <-> '-90:91 -126:91 -72:109 (Template)'
%     4 <-> '-95:95 -112:76 -50:95 '
% 'direction1', VALUE_ARRAY ([xmin;xmax])
% 'direction2', VALUE_ARRAY ([ymin;ymax])
% 'direction3', VALUE_ARRAY ([zmin;zmax])
% 'voxel_sizes'
%     0:7 <-> 'Customise|1 1 1|1.5 1.5 1.5|2 2 2|3 3 3|...
%           4 4 4|1 1 2|2 2 4'
% 'voxel_sizes_custom', VALUE_ARRAY (1*3)
%
%.....[MULTIPLE].....
% 'image'      STRING_ARRAY (1*nsubjects)
%                to determine parameters from,
% 'objmask'    STRING_ARRAY (1*nsubjects)
%                object masking image, '' for none,
% 'matname'    STRING_ARRAY (1*nsubjects)
%                normalisation parameter set,
% 'images'     {STRING_ARRAYS} (1*nsubjects)
%                images to write normalised,
%

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%=====
% [MODEL] -> [CONDITIONS] [STOCHASTICS] [REGRESSORS] [PARAMETRICS]
%=====
%-----
% model : STRUCT % [MODEL]
%-----
%.....[UNIQUE].....
% 'types'
%           1 <-> 'specify a model',
%           2 <-> 'review a specified model',
%           3 <-> 'estimate a specified model',
%           4 <-> 'specify and estimate a model'
% 'global_effects', 'Scaling|None',
% 'burst_mode',    'y/n',[1 0],
% 'HF_fil',        'none|specify',
% 'LF_fil',        'none|Gaussian|hrf',
% 'LF_cut',        VALUE,
%                  'Gaussian FWHM (secs)'
% 'int_corr',      {'none','AR(1)'},
% 'trial_fcon',    'yes|no', [1,0],
% 'now_later',     'now|later', [1,0],
% 'stop_writing', 0 if previous results should be overwritten, 1
otherwise
% 'RT',            VALUE,
% 'replicated',    'yes|no',[1 0],
% 'same_time_param','yes|no',[1 0],
% 'nssess',        VALUE
%                  number of sessions
%.....[MULTIPLE].....
% 'HF_cut'         INTEGER_ARRAY
%                  'session cutoff period (secs)'
% 'files',         {STRING_ARRAYS},
% 'nscans',        INTEGER_ARRAY,
% 'conditions_nb', INTEGER_ARRAY,
% 'regressors_nb', INTEGER_ARRAY,
% 'parametrics_type', STRINGS, {'none','time','other'},
% 'stochastics_flag', INTEGER_ARRAY, 'yes|no',[1 0],
% 'conditions',    INDICES,
% 'stochastics',   INDICES,
% 'regressors',    INDICES,
% 'parametrics',   INDICES
%
%-----
% stochastics : STRUCT % [STOCHASTICS]
%-----
%.....[UNIQUE].....
% 'null_event',    'y/n',[1 0]
% 'soa',           VALUE
%                  SOA (scans)
% 'relative_frequency', VALUE
%                  'relative frequency [trial 1,..'
% 'stationary_or_modulated', 'stationary|modulated',[1 0]
%

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%-----
% regressors : STRUCT % [REGRESSORS]
%-----
%.....[MULTIPLE].....
% 'names',          STRINGS
% 'values',         ARRAY (number of scans x number of regressors)
%
%-----
% parametrics : STRUCT % [PARAMETRICS]
%-----
%.....[UNIQUE].....
% 'name',           STRING
% 'exp_type',       {'linear','exponen','polynom'}
% 'time_cst',       VALUE
%                   'time constant {secs}'
% 'decay_cst',     VALUE
% 'order',          VALUE
%.....[MULTIPLE].....
% 'trials',         INTEGER_ARRAY
% 'parameters',    VALUE_ARRAYS
%
%=====
% [CONDITIONS] -> [BF_EV] [BF_EP]
%=====
%-----
% conditions : STRUCT % [CONDITIONS]
%-----
%.....[UNIQUE].....
% 'volterra',       'y/n',[1 0]
% 'variable_dur',   'yes|no',[1 0],
%.....[MULTIPLE].....
% 'types',          STRINGS, {'events','epochs'},
% 'names',          STRINGS
% 'onsets',         VALUE_ARRAYS
% 'durations',      VALUE_ARRAYS
% 'bf_ev',          INDICES
% 'bf_ep',          INDICES
%
%-----
% bf_ev : STRUCT % [BF_EV]
%-----
%.....[UNIQUE].....
% 'ev_type'
% 1 <-> 'hrf (alone)',
% 2 <-> 'hrf (with time derivative)',
% 3 <-> 'hrf (with time and dispersion derivatives)',
% 4 <-> 'basis functions (Fourier set)',
% 5 <-> 'basis functions (Windowed Fourier set)',
% 6 <-> 'basis functions (Gamma functions)',
% 7 <-> 'basis functions (Gamma functions with derivatives)';
% 'win_len',VALUE|[]
%                   'window length {secs}'
% 'order',          VALUE|[]
%

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%-----
% bf_ep : STRUCT % [BF_EP]
%-----
%.....[UNIQUE].....
% 'ep_type'
% 1 <-> 'basis functions (Discrete Cosine Set)',
% 2 <-> 'basis functions (Mean & exponential decay)',
% 3 <-> 'fixed response (Half-sine)',
% 4 <-> 'fixed response (Box-car)';
% 'fct_nb', VALUE,
% 'number of basis functions'
% 'conv', 'yes|no', [1 0]
% 'deriv', 'yes|no', [1 0]
% 'length', VALUE
% 'epoch length {scans} for condition'
%
%=====
% [CONTRASTS]
%=====
% ATTENTION : the contrasts size must be of the number of parameter
% of the design matrix, INCLUDING block (session) effects.
% Contrasts can be taken from old xCon.mat file in the xCon(i).c'
%
%-----
% contrasts : STRUCT % [CONTRASTS]
%-----
%.....[MULTIPLE].....
% 'names', STRINGS,
% 'types', {'F'|'T'},
% 'values', VALUE_ARRAYS,
%

```