

# McStas sample model functionality-matrix

(Master version available at the URL <https://confluence.esss.lu.se/display/MCSTAS/McStas+sample+model+functionality-matrix> )

Status of the McStas sample components, relevant for McStas 2.7 and 3.0 (Released December 2020)

	McStas sample comp  + author info in italic	Model description	Main use areas	Incoherent scattering	Absorption	Bragg or other elastic scattering (type)	Inelastic scattering (type)	Multiple scattering	Non-trivial sample geometry
1	<a href="#">Incoherent</a> (Vanadium, Plexiglass etc.) <i>McStas team</i>	Simple incoherent scatterer	Generic, <a href="#">imaging</a>	✓	✓	✗	✗	✓	✓
2	<a href="#">Tunnelling_sample</a> <i>McStas team / Kim Lefmann</i>	Idem 1, plus tunneling peaks and QE broadening	Quasi-elastic scattering, backscattering	✓	✓	✗	✗ ✓ (Quasi-elastic broadening + tunnel peaks)	✓ analytic approach)	✓
3	<a href="#">PowderN</a> <i>McStas team / Peter Willendrup</i>	Debye-scherrer cones, tabular input ( <a href="#">lau</a> / <a href="#">laz</a> )	Powder <a href="#">diffraction</a> , <a href="#">imaging</a>	✓	✓	✓ (Debye-Scherrer cones)	✗	✗	✓
4	<a href="#">Sample_nxs</a> <i>Mirko Boin, HZB</i>	Debye-scherrer cones, unit-cell / atom input list	Powder <a href="#">diffraction</a> , (future: <a href="#">imaging</a> )	✓	✓	✓ (Debye-Scherrer cones)	✗ ✓	✓	✗
5	<a href="#">Single_crystal</a> <i>McStas team</i>	Bragg spots, tabular input ( <a href="#">lau</a> ). "Perfect imperfect" single crystal with mosaicity / lattice variation	Single crystal and MX <a href="#">diffraction</a>	✓	✓	✓ (Bragg spots)	✗	✓	✓
6	<a href="#">Sans_spheres</a> (and other similar) <i>McStas team and Martin Cramer Pedersen, KU</i>	Hard spheres in thin solution and other models, defined per-component...	<a href="#">SANS</a>	✓	✓	✓ - SANS	✗	✗	✗
7	<a href="#">SANS_benchmark2</a> (and a few other stand-alone models) <i>Heinrich Frielinghaus, FZJ/JCNS</i>	Experimentally-benchmarked model set for SANS	<a href="#">SANS</a>	✓	✓	✓ - SANS	✗	✓ up to 10 orders	✗
8	<a href="#">SASview_models</a> <i>McStas team</i>	"Any" model from SASview / SASmodels	<a href="#">SANS</a>	✓	✓	✓ - SANS	✗	✗ at this point	✗
9	<a href="#">Multilayer_sample</a> <i>Rob Dalgliesh, ISIS STFC</i>	Multilayer-sample (additions of phase via matrix-formalism) with incoherent background	<a href="#">Reflectometry</a>	✓	✓	✓ - Reflectivity curve	✗	✗	✗
10	<a href="#">Phonon_simple</a> <i>McStas team / Kim Lefmann</i>	Single-branch acoustic phonon in FCC lattice	Inelastic scattering phonons	✗	✗	✗	✓ (phonon, at this point FCC lattice only)	✗	✗

11	<a href="#">Magnon_bcc</a> <i>McStas team / Kim Lefmann</i>	BCC crystal n.n. and n.n.n. interactions only Can do either FM or AFM order upon a flag	Inelastic scattering  FM/AFM magnons	✗	✗	✗	✓ (magnon, at this point BCC lattice only)	✗	✗
12	<a href="#">Isotropic_Sqw</a> <i>McStas team / Emmanuel Farhi</i>	Structure and dynamics in isotropic materials  (liquids, powders etc.)	Inelastic scattering, diffraction,  isotropic materials, imaging	✓	✓	✓ (Debye-Scherrer cones)	✓ isotropic inelastic scattering	✓	✓
13	<a href="#">Res_sample</a> <i>McStas team</i>	Resolution-oriented sample component	Generic	✓	✗	✗	✓ "flat, isotropic inelastic scattering"	✗	✗
14	<a href="#">TOFRes_sample</a> <i>McStas team / Kim Lefmann</i>	Idem Res_sample, with TOF support	Generic	✓	✗	✗	✓ "flat, isotropic inelastic scattering"	✗	✗
15	<a href="#">Spot_sample</a> <i>Garrett Granroth, SNS /ORNL</i>	Resolution-oriented sample component  Dirac delta-functions in (Q and energy)	Inelastic scattering	✗	✗	✓	✓	✗	✗
16	<a href="#">Union components</a> , <i>Mads Bertelsen, ESS</i>	A set of components that allows to build a complex sample/sample environment from basic geometries and physics/material properties	Generic	✓	✓	✓ Single crystalline or Powder crystalline	✓ - single acoustic phonon being included (2018)	✓	✓ - if built from cylinders, spheres, boxes, ...)
17	<a href="#">Single_crystal_inelastic</a> <i>Duc Le, ISIS STFC</i>	4D-equivalent of Isotropic_Sqw / Single_crystal	Elastic and inelastic  experiments with crystals	✓	✓	✓	✓	✓	?_?
18	<a href="#">Magnon_bcc</a> <i>McStas team / Kim Lefmann</i>	FM / AFM magnon in BCC lattice	Inelastic scattering magnon	✗	✗	✗	✓ (magnon, at this point BCC lattice only)	✗	✗
19	<a href="#">NCrystal_sample</a> <i>Xiao Xiao Cai, DTU Nutech /ESS</i>	Single crystal and powder diffraction, with isotropic inelastic scattering	Powder and Single_crystal diffraction, imaging	✓	✓	✓	✓ (in an isotropic form)	✓	
20	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>	<b>Below this line not yet available in repo</b>
21	"Polycrystal" <i>Alberto Cereser + Erik Knudsen, DTU Physics</i>	Engineering-diffraction / imaging oriented multigrain sample	Engineering-diffraction / imaging	✓	✓	✓ (Bragg spots)	✗	✓	✓
22	"Magnetic single crystal" <i>Linda Udby KU, + Erik Knudsen, DTU</i>	Bragg spots from lattice ala Single_crystal plus magnetic lattice. Tabular input (lau)	Single crystal magnetic diffraction	✓	✓	✓ (Bragg spots)	✗	✓	✓ / ?_?
23	"Specular reflectometry"	Use a reflectivity-curve with e.g. Mirror.comp	Reflectometry	✓	✓	✓ - Reflectivity curve	✗	✗	✗