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**Supporting information for article:**

**Artifact removal in the contour areas of SAXS-CT images by  
Tikhonov-L1 minimization**

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### Polymer properties and measurement samples

The properties of the high-density polyethylene (HDPE, Tosoh Corporation) are shown below.

$M_n$ (the number average molecular weight)	56,700
$M_w$ (the weight average molecular weight)	12,900
Polydispersity index	4.4
MFR (melt mass-flow rate)	20 g/10min
Density	0.955 g/cm <sup>3</sup>

The HDPE pellets were first melted at 220°C for 15 minutes using a hot press, after which heat compression molding was applied at 220°C for 15 minutes at 15 MPa, and then they were cooled to room temperature by water to obtain flat plates of approximately 2 × 75 × 50 mm<sup>3</sup>. The obtained flat plates were then cut on four sides into a cuboid with dimensions of 0.86 × 0.98 × 22.5 mm<sup>3</sup> at -30°C using a microtome to make measurement samples.

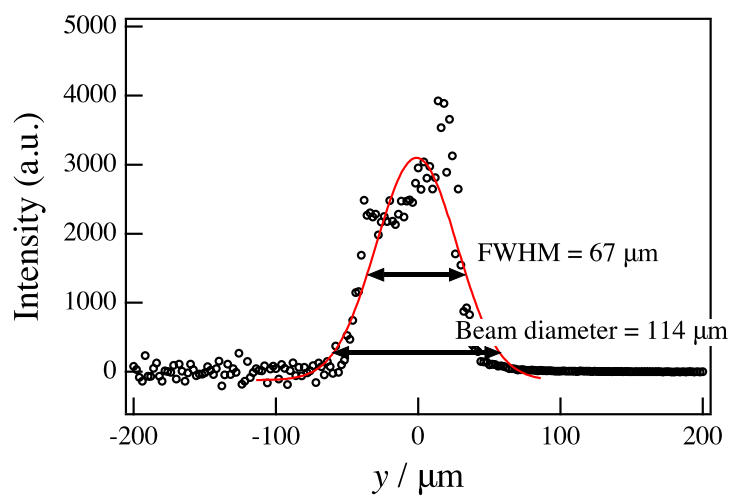
**Vertical beam profile at the sample position**

Figure S1. Measured vertical beam profile at the sample position using blade scanning (black circles) and the fitted profile (red solid line).

**MATLAB Implementation code of our main part**

```
for i = 1:maxIter upre = u;

% update u

u = u - gamma1*(Dt(z1) + z2);

utemp = v;

utemp(nInd) = u(nInd);

u = utemp; % update z1

z1 = z1 + gamma2*D(2*u - upre);

temp1 = z1/gamma2;

temp1 = temp1/(2/gamma2 + 1);

z1 = z1 - gamma2*temp1; % update z2

z2 = z2 + gamma2*(2*u - upre);

temp2 = z2/gamma2;

temp2v = temp2-v;

temp2 = v + sign(temp2v).*max(abs(temp2v)-lambda/gamma2, 0);

z2 = z2 - gamma2*temp2; % stopping condition

res = u - upre;

error = norm(res(:),2)/norm(u(:),2);

if i>10 && error < stopcri

break;

end
```