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Check dependence of single vs. multiple scattering

Measure the correlation in multiple scattering and single scattering cases, where the light and view are rotated around the z axis

```
span = 22; % how ll source is far from z axis (in degrees)
alpha = 0:3:90; % the rotation directions (in degrees)
```

```
% Build the target area
boxTargetArea = boxArea( ...
    1 ,          ... wavelength
    20,          ... MFP
    [-50,50],   ... z
    [-50,50],   ... x
    [-50,50]    ... y
);

scatter = isotropicScatter;

singleCorr = zeros(1,numel(alpha));
mulCorr = zeros(1,numel(alpha));
totalCorr = zeros(1,numel(alpha));
```

Measure correlation

```
l1 = [-sind(span), 0, cosd(span)];
v1 = [-sind(span), 0, -cosd(span)]; % minus for backward scattering

tic
for a = 1:1:numel(alpha)
    % Build the rotation matrix around z axis
    R_alpha = [ ...
        cosd(alpha(a)), -sind(alpha(a)), 0; ...
        sind(alpha(a)), cosd(alpha(a)), 0; ...
        0                0                1];

    l2=(R_alpha*l1')';
    v2=(R_alpha*v1')';

    % Solve
    mulres = scmc(boxTargetArea, ...
```

```

        farFieldSource([v1',v2']), ...
        farFieldSource([l1',l2']), ...
        scatter,le3, ...
        'mean', false, ...
        'singleScattering', true, ...
        'parforIters', 12);

singleCorrMatrix = mulres.Csingle(:, :, 1, 2);
totalCorrMatrix = mulres.C(:, :, 1, 2);
[~,maxCorrIdx] = max(abs(totalCorrMatrix(:)));

singleCorr(a) = abs(singleCorrMatrix(maxCorrIdx));
mulCorr(a) = abs(totalCorrMatrix(maxCorrIdx) -
singleCorrMatrix(maxCorrIdx));
totalCorr(a) = abs(totalCorrMatrix(maxCorrIdx));

end
toc

maxCorr = max(totalCorr);

Elapsed time is 15.523419 seconds.

```

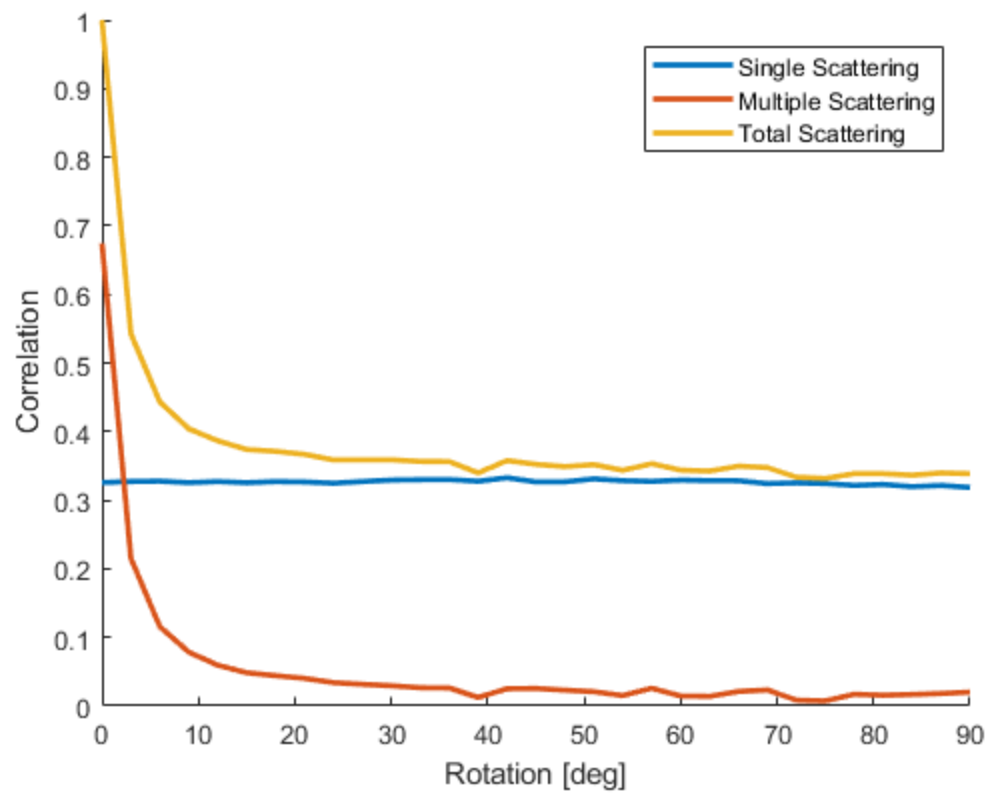
Comapare between single scattering the multiple scattering

```

figure;
hold on
plot(alpha,singleCorr/maxCorr,'lineWidth',2);
plot(alpha,mulCorr/maxCorr,'lineWidth',2);
plot(alpha,totalCorr/maxCorr,'lineWidth',2);

legend('Single Scattering','Multiple Scattering','Total Scattering')
xlabel('Rotation [deg]');
ylabel('Correlation');

```



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