```matlab
function Gamma = GammaQuat(q)

% Usage: Gammaba_b = GammaQuat(q)
%
% Description: This function takes in a Direction Cosine Matrix (DCM)
% representing a rotation between too frames and returns the same
 rotation
% represented as a quaternion q.
%
% Inputs:
%   q  -  4 x 1 quaternion vector consisting of [epsilon(3 x 1) eta]'
%           representing a rotation between two coordinate frames
%
% Outputs:
%   Gamma  -  4 x 3 matrix that maps the angular velocity between two
%             frames to the quaternion rate of change
%
% Garrett Ailts
% Updated 1/2020
%
```

Compute Gamma

```matlab
Gamma = 0.5*[q(4)*eye(3)+crossMatrix(q(1:3)) q(1:3);
             -q(1:3)' q(4)];

end
```

```
Gammaba_b =

    0.4829   -0.0915    0.0647    0.0647
    0.0915    0.4829   -0.0647    0.0647
   -0.0647    0.0647    0.4829    0.0915
   -0.0647   -0.0647   -0.0915    0.4829
```

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