$$\phi_1(\underline{m}) = \max_{1 \leq k \leq 3} c_{1,k} \, |\langle \underline{m}, \underline{\xi}_{1,k} \rangle|$$

$$c_{1,1} = \frac{\sqrt{2}}{2} \qquad c_{1,2} = 1 \qquad c_{1,3} = \frac{\sqrt{2}}{2}$$

$$\underline{\xi}_{1,1} = (1,0) \quad \underline{\xi}_{1,2} = \left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right) \quad \underline{\xi}_{1,3} = (0,1)$$

$\underline{m}$ and $\underline{\xi}$ unit vectors

$$\phi_1(\theta) = \max_{1 \leq k \leq 3} c_{1,k} \, |\cos(\theta_m - \theta_{\xi})|$$

More details: measure of the tubular neighborhood of S

$$\phi(\underline{m}) = \limsup_{\varepsilon \to 0} \frac{|S_\varepsilon|}{\varepsilon \, \mathcal{H}_1(S)}$$

"mesh-size"

segment

lenght of the segment?

The tubular neighborhood is the set of elements crossed by S?

triangulation

$$S_\varepsilon = \{ T \in \mathcal{T}_\varepsilon : T \cap S \neq \emptyset \text{ and } |T \cap (S + t\underline{m})| \neq \emptyset \text{ for } t \in]0;1[\}$$

element of the triangulation

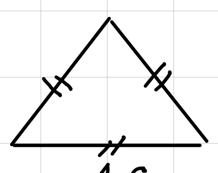
T must intersect with S

$\phi(\underline{m})$ corresponds to the ratio of surface of the tubular neighborhood to the product of the mesh size with the segment lenght when to mesh size goes to 0.

$$\underline{\xi}_1^{(1)} = \varepsilon\,(1,0)$$

$$\underline{\xi}_2^{(1)} = \varepsilon\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$$

$$\underline{\xi}_3^{(1)} = \varepsilon\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$$



$1 \times \varepsilon$

We obtain:

$$\phi^{(1)}(\underline{m}) = \lim_{\varepsilon \to 0} \frac{\sum_{T \in S_\varepsilon^{(1)}} |T|}{\varepsilon \, \underbrace{\mathcal{H}^1(S)}_{1}}$$

where $|T|$ is the area of an equilateral triangle:

$$|T| = \varepsilon^2 \frac{\sqrt{3}}{4}$$

$$\phi^{(1)}(\underline{m}) = \lim_{\varepsilon \to 0} \frac{\#(S_\varepsilon^{(1)}) \, \varepsilon^2 \frac{\sqrt{3}}{4}}{\varepsilon}$$

The next step consists in counting the number of element crossed by S (unit lenght) for each normal $\underline{m}$.

↪ see proof of Lemma 3.1 in Negri 1999.

(I don't really understand the "By a simple trigonometric argument, we have $h(\varepsilon)\langle \underline{\xi}_3^{(1)}, \underline{m} \rangle = \varepsilon\sqrt{3}/2$.

NOTE: Could we do it for quads?

NOTE: to combine with the "dissipation correction"

$$G_c = \frac{G_0}{1 + \ldots}$$