**Damping**

In structural analysis after applying frequency the members (beams and columns) are bouncy. In reality, after few bounces the structure comes to rest. It can’t not just happen by changing the stiffness (it will never s down and coming to rest). Here is the damping (matrix and factor) comes handy as solution which it must applied to each elements/ member.

Damper resist fast in changes in displacement. In other words, it brings the structure to rest quickly.

**Overview**

* Damping is present in all oscillatory systems.
* Acts to dissipate mechanisms are complex.
* Simple damping assumption is Linear Dynamics

**Damping effect:**

Damping dissipates energy (energy out)

|  |  |
| --- | --- |
|  | **Short duration loading** – at end of input:   * Energy out decays the responses to zero |
|  | **Harmonic loading:**   * Initially: energy in > energy out * At steady state: energy in = energy out |

Table-x on damping effects

|  |  |
| --- | --- |
|  | Also damping level are included:   * Critical damping (100%)   + Fastest return, no oscillations * Underdamped   + Oscillations occurs (<100)   + Overdamped (>100)   + No oscillations - slow return |

Table-x on damping level

Ref.

* **2018, ‘What is damping?’, *Dynamic analysis*, simulation, Linkedin, unknown, 16th September 2019, <**<https://www.linkedin.com/learning/solidworks-simulation-dynamic-analysis/what-is-damping>**>.**
* **2016, *Stiffness and damping*, simulation, Khan Academy, 16th September 2019, <**<https://www.khanacademy.org/partner-content/pixar/simulation/hair-simulation-101/v/sim3-launch>**>.**