# Temperature & Pressure Sensitive Paint (TSP & PSP)Via Thermal & Oxygen Quenching of Luminescence

Temperature

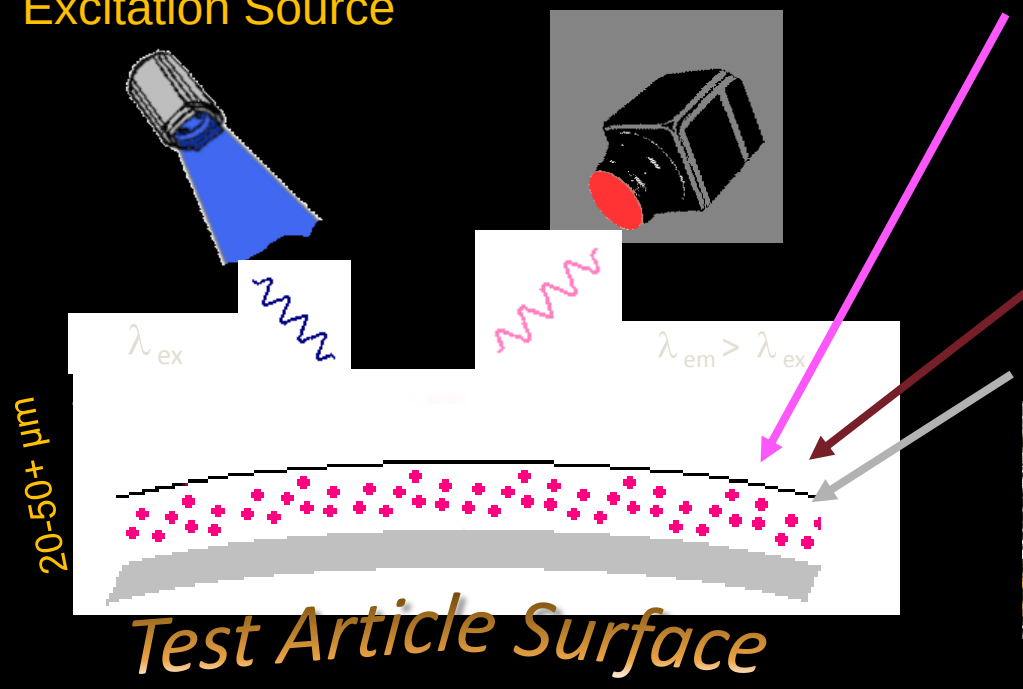
$$I(T) = I_0 e^{\frac{-t}{\tau(T)}}$$

Pressure

$$\frac{\tau_0}{\tau_{O_2}} = \frac{I_0}{I_{O_2}} = 1 + K_{SV} P_{O_2}$$

Excitation Source

Emission Detector



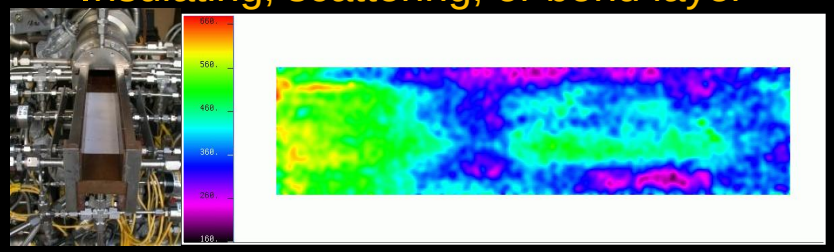

Temperature-sensor:
High temp: thermographic phosphors
Low temp: EuTTA, Ru (bpy)

Pressure-sensor:
Ruthenium complexes, Metal porphrins

TSP binders : shellac, commercial paint, polymer or ceramic coatings

Oxygen permeable PSP binders ~ 20µm: polymer, silicone rubber or porous solids

Insulating, scattering, or bond layer



Cooled Panel Rocket Testing TSP withstands 1400 C with