

Grupo de Pesquisa: Dinâmica dos Fluidos Computacional (CFD/UFPR)

Prof. Carlos Henrique Marchi (líder)

Prof. Luciano Kiyoshi Araki

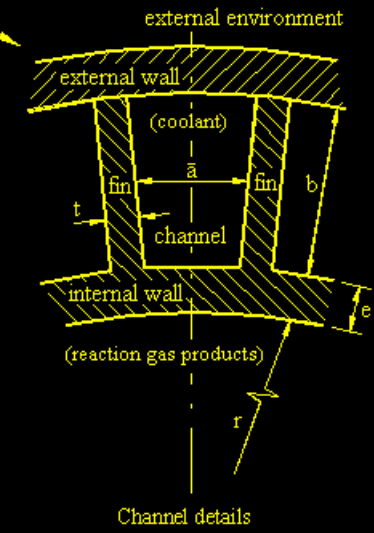
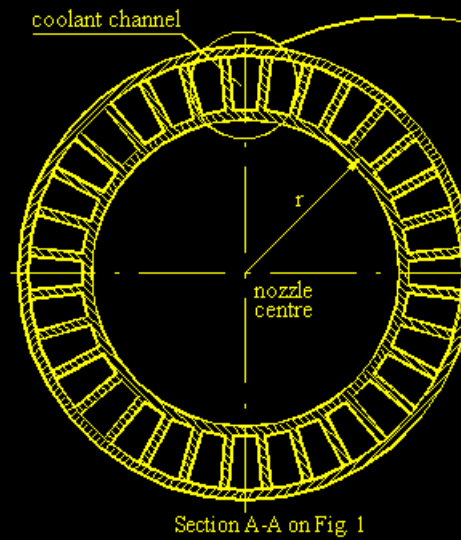
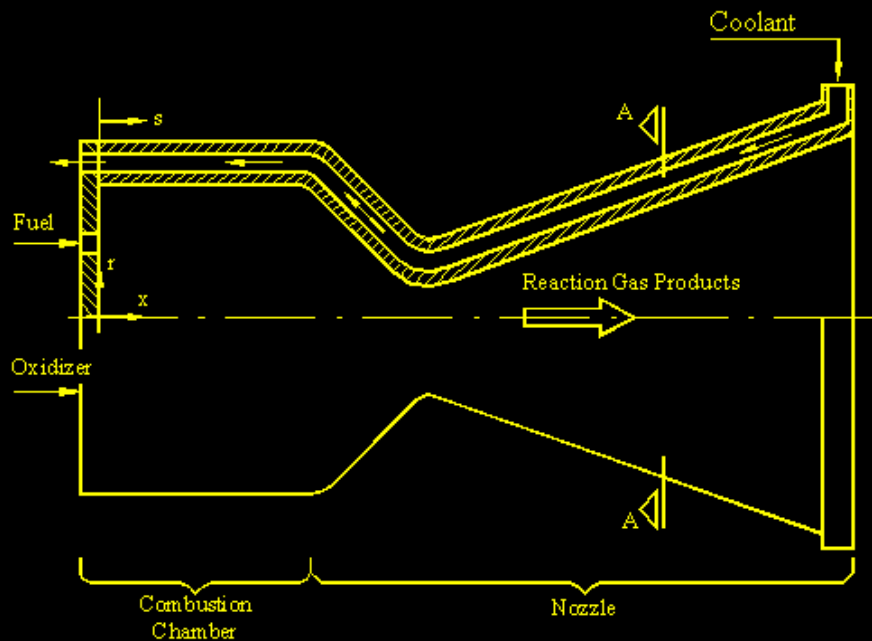
Prof. Márcio Augusto Villela Pinto

Linhas de Pesquisa

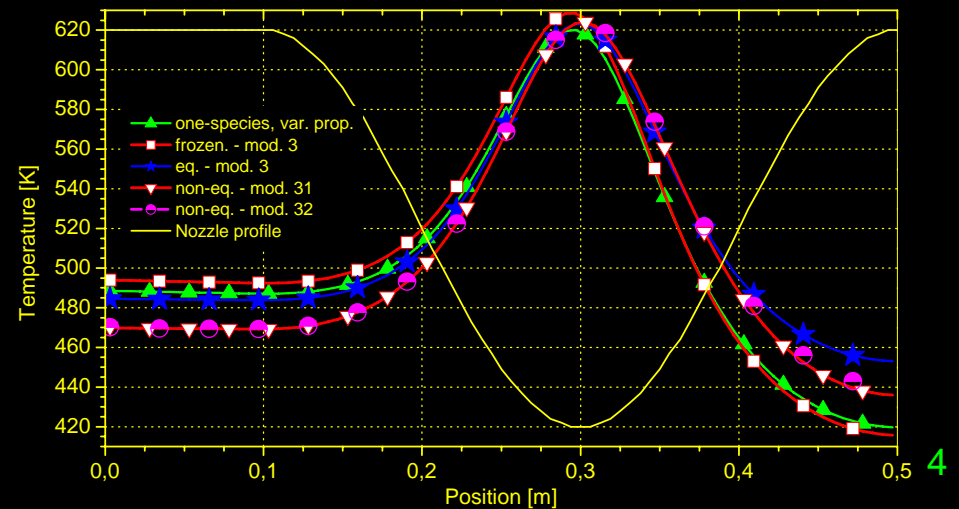
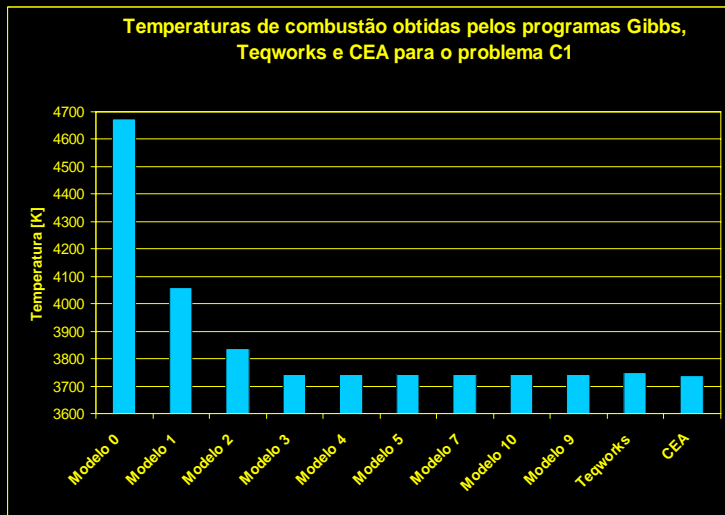
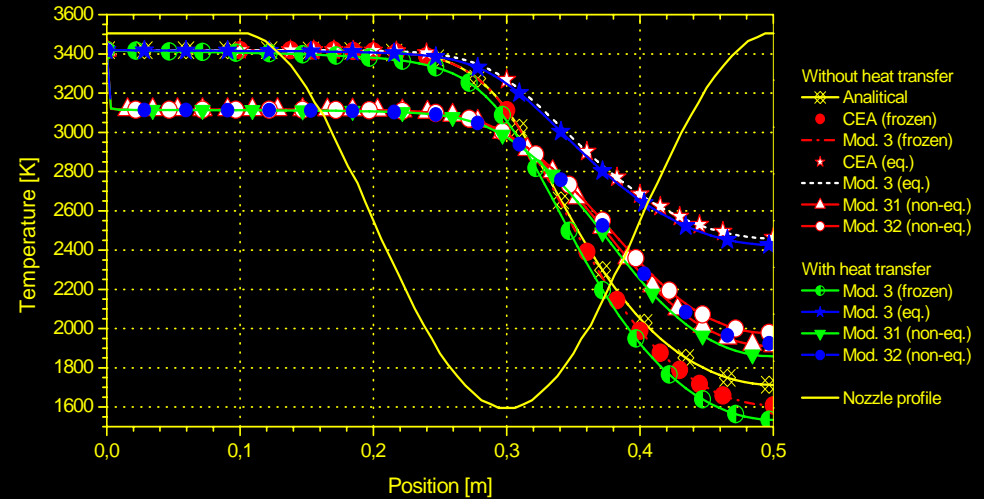
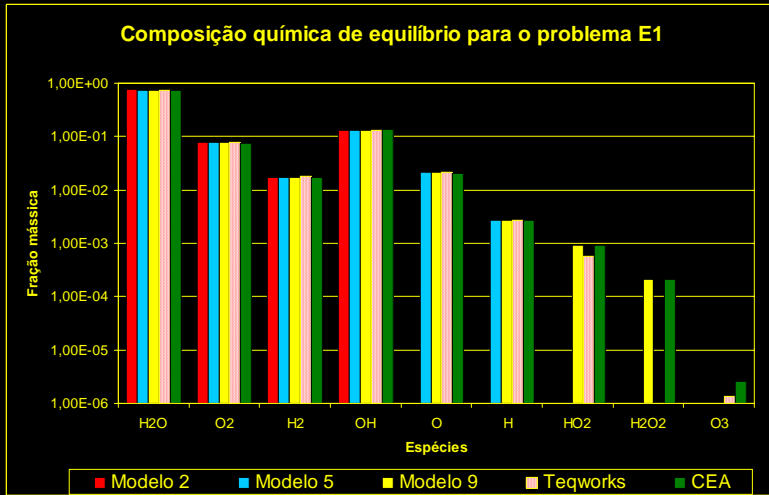
- Aplicação de métodos numéricos
- Otimização de métodos numéricos
- Verificação e validação de métodos numéricos

Aplicação de métodos numéricos

- Propulsão de foguetes
- Aerodinâmica de foguetes



Aplicação de métodos numéricos



Aplicação de métodos numéricos

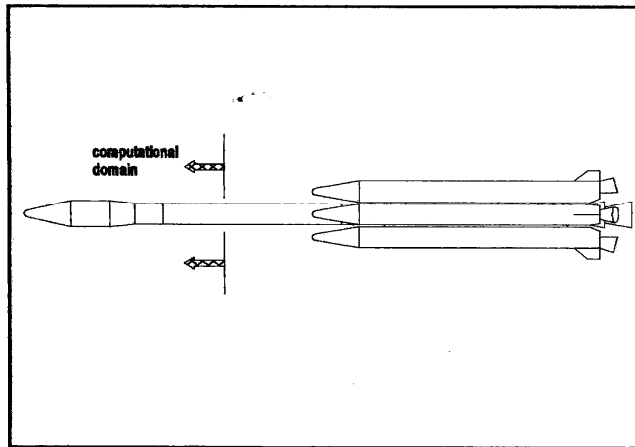


Fig. 1 Configuração completa do foguete VLS.

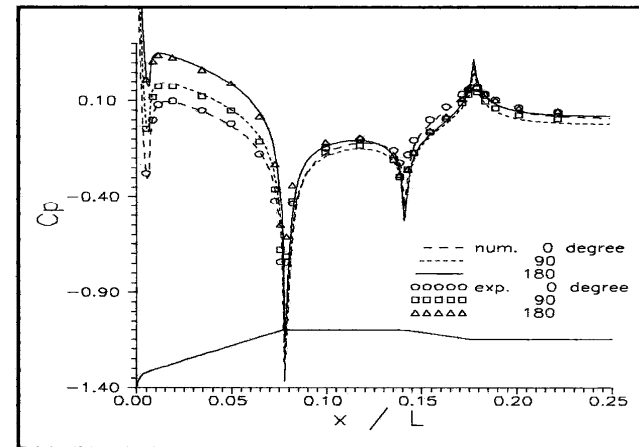


Fig. 2 C_p para $M_\infty = 0,50$ e $\alpha = 6,0^\circ$.

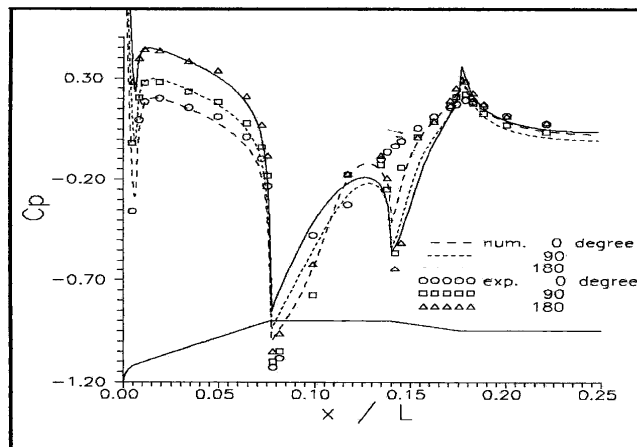


Fig. 3 C_p para $M_\infty = 0,90$ e $\alpha = 6,0^\circ$.

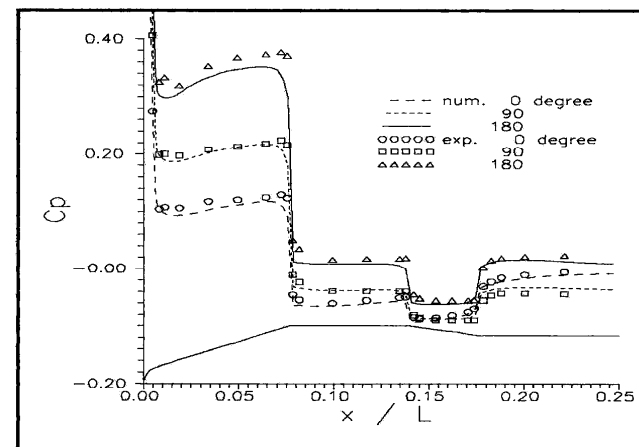
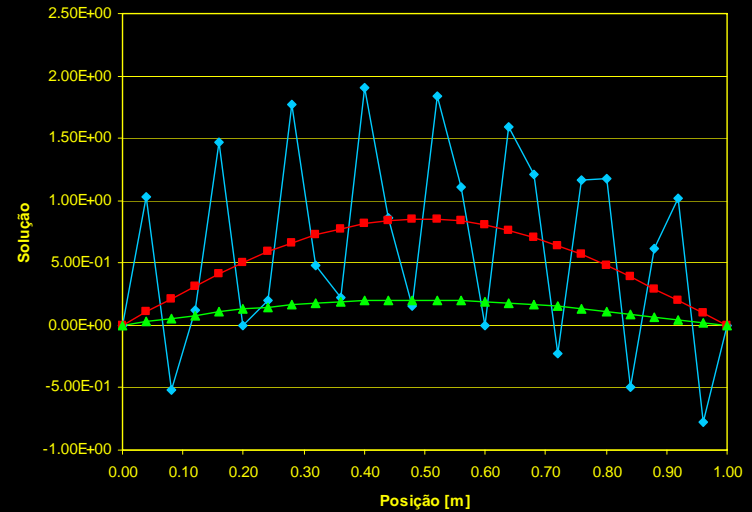
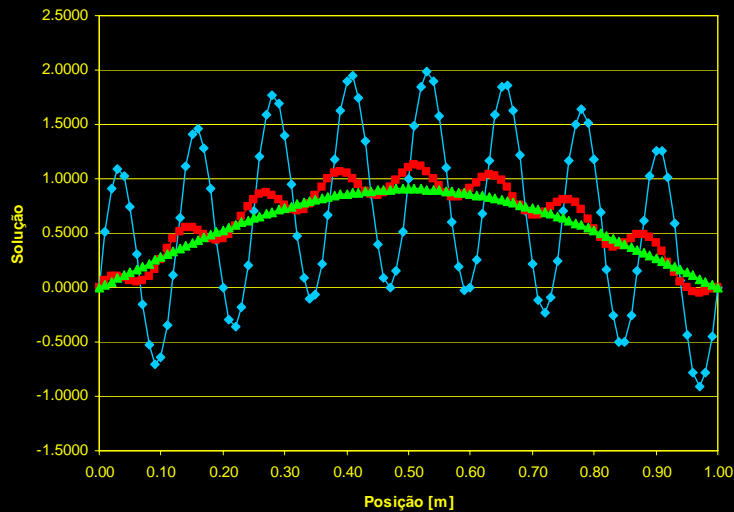
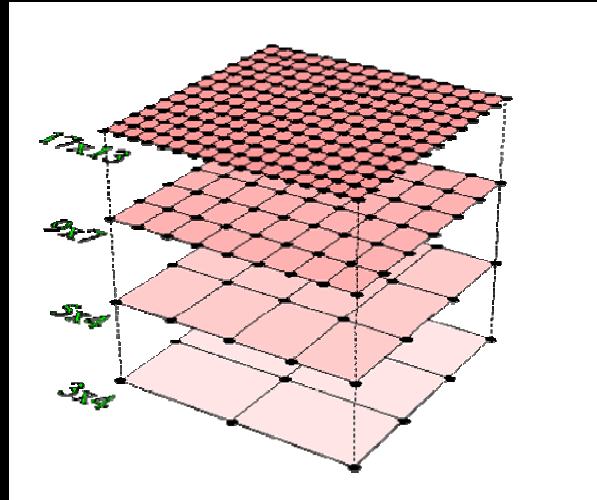


Fig. 4 C_p para $M_\infty = 3,0$ e $\alpha = 6,1^\circ$.

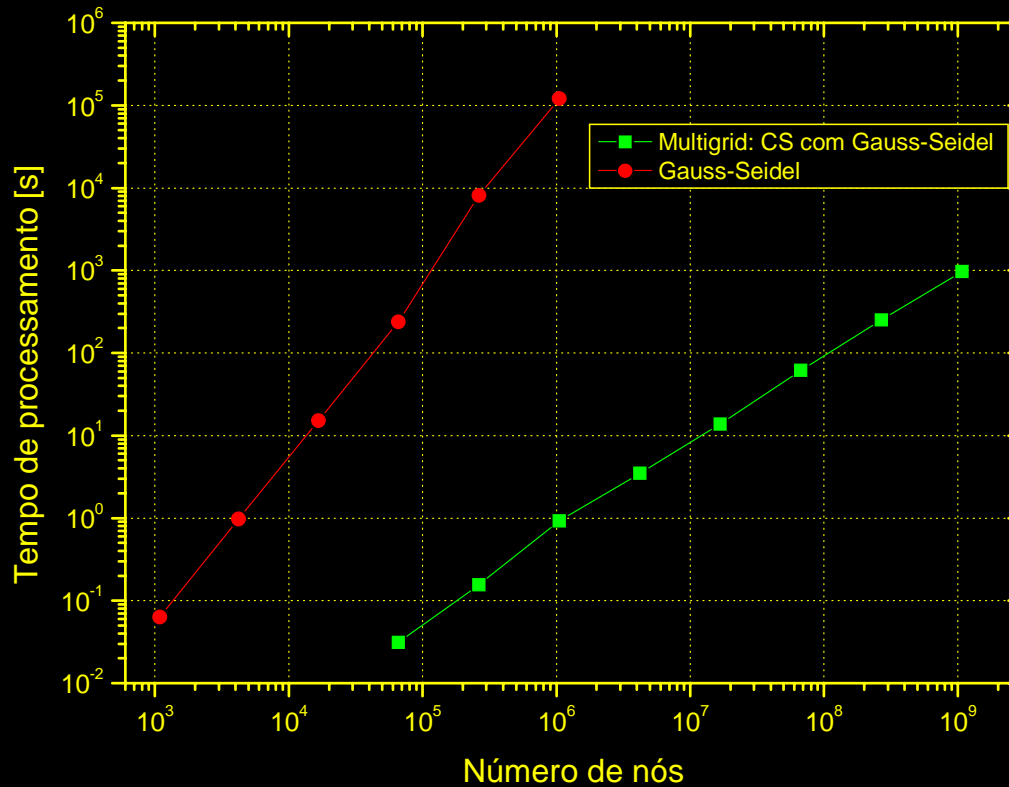
Otimização de métodos numéricos

- Métodos *multigrid* geométricos e algébricos
- Funções de interpolação, aproximações numéricas ou esquemas numéricos
- Múltiplas extrapolações de Richardson

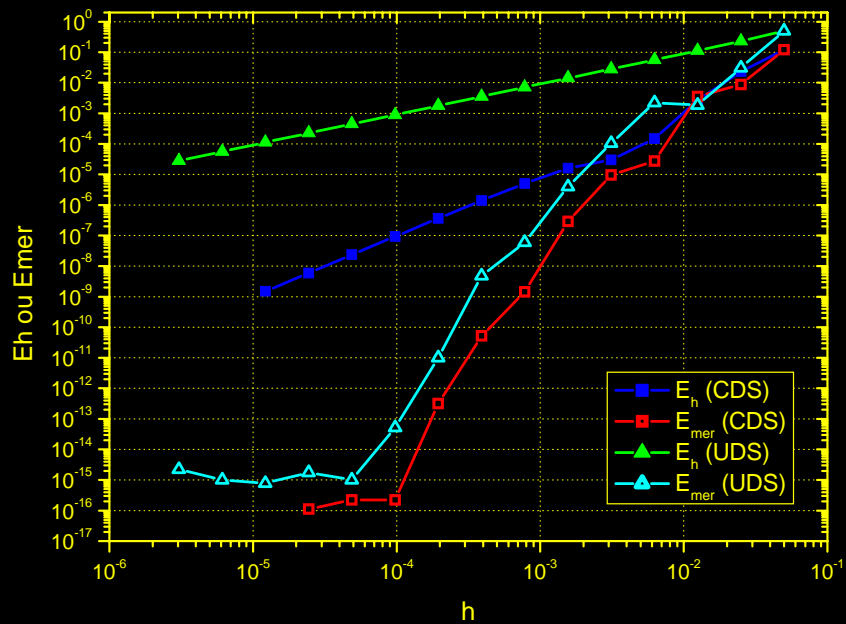
Otimização de métodos numéricos



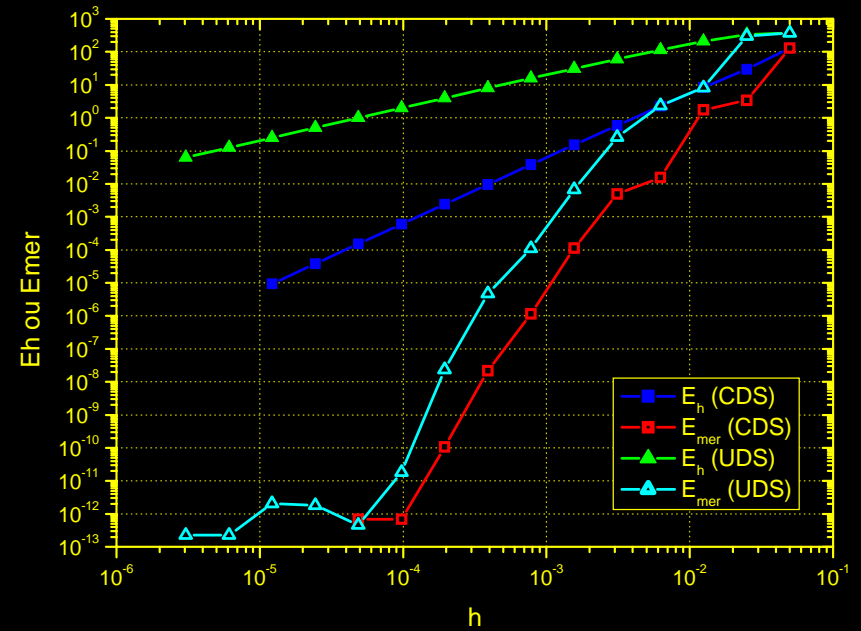
Otimização de métodos numéricos



Otimização de métodos numéricos



Coeficiente de descarga



Temperatura na saída da tubeira

Verificação e validação de métodos numéricos

