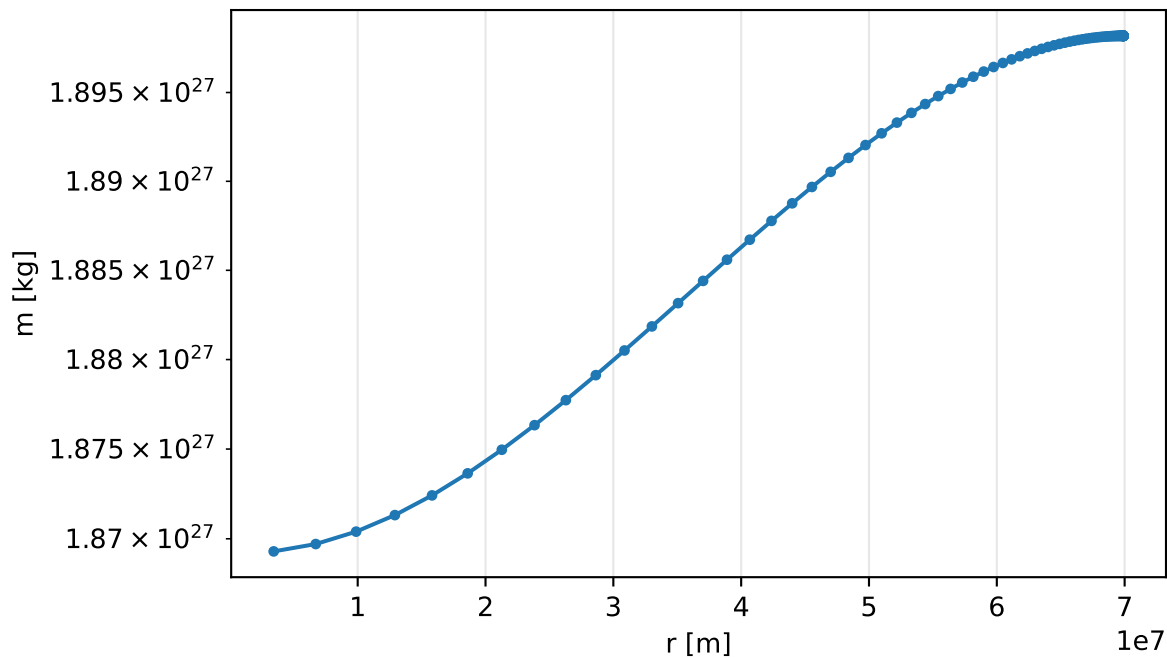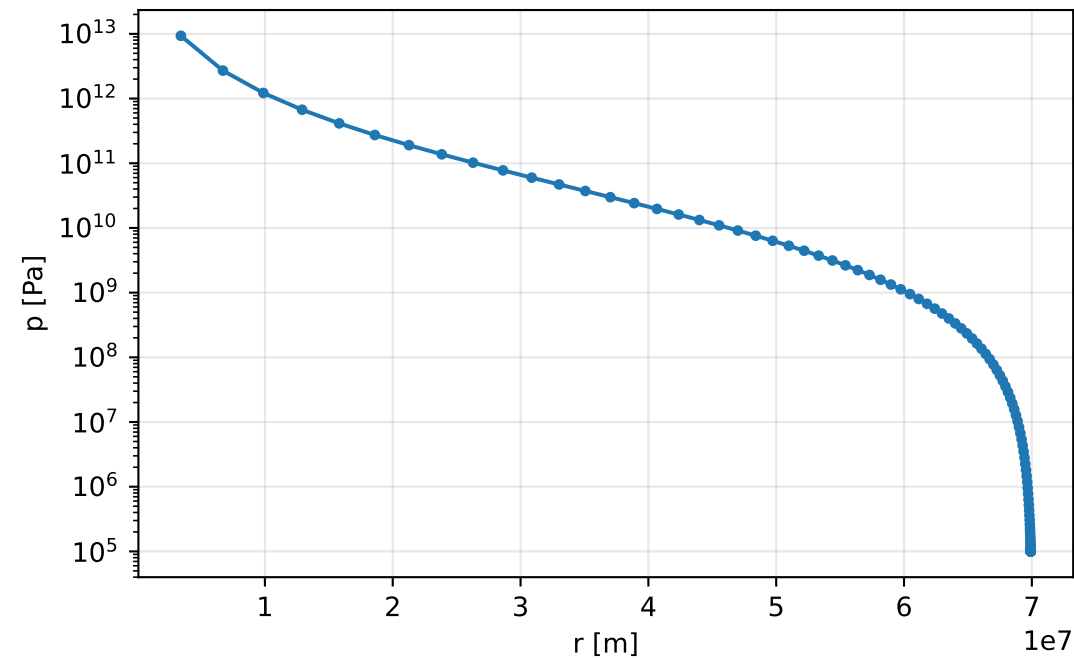polytropic Jupit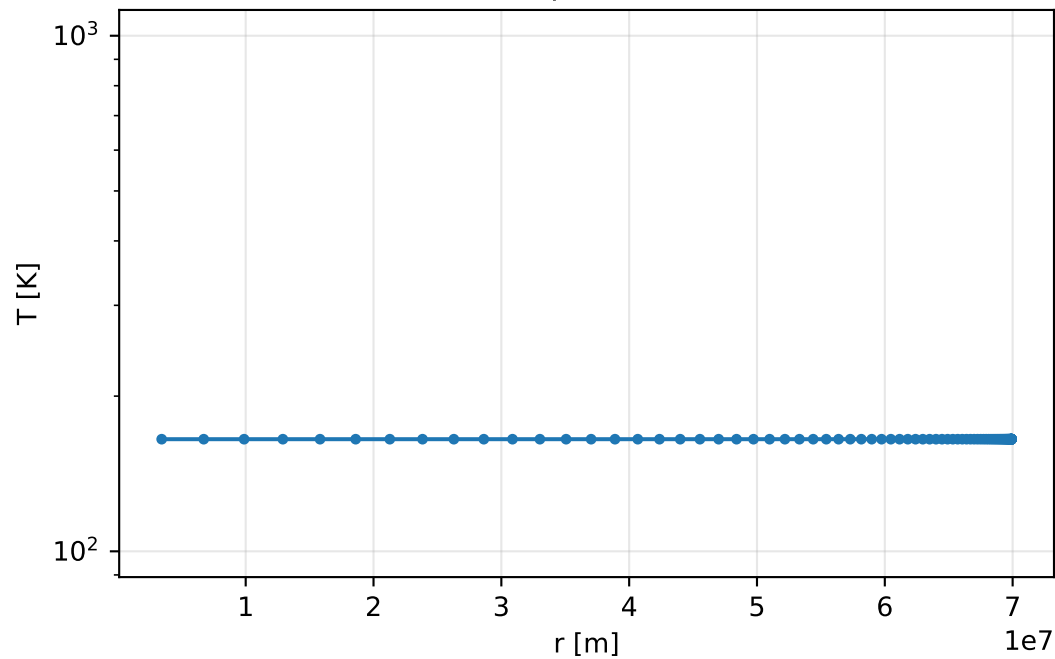er