Contribution Title:	GLOBAL PROPERTIES OF EXPANDING SPACETIMES WITH CYLINDRICAL GRAVITATIONAL WAVES
Authors:	M. Narita
Presenting author:	Narita M.
Affilation:	Okinawa National College of Technology
E-mail:	narita@okinawa-ct.ac.jp
Invited speaker:	
YRS seminar:	NO

The strong cosmic censorship conjecture (SCCC) is one of the most important and unsolved problems in classical mathematical relativity. Recently, the validity of SCCC has been shown under certain assumptions, e.g. spherical, homogeneous, T^3-Gowdy symmetries. To extend these results, we will consider expanding spacetimes with unpolarized cylindrically symmetric gravitational waves, which are proposed by Gowdy and Edmonds. The metric is $g = e^{2(\eta-U)}(-dt^2+dr^2)+e^{2U}(dx+Ady)^2+e^{-2U}R^2dy^2$, where $\eta=\eta(t,r)$, $U=U(t,r)$, $A=A(t,r)$ and $R=tr$. We prove a global in time existence theorem for the corresponding Einstein equations. Into the past direction, it is shown that the solutions to the Einstein equations become asymptotically velocity-dominated near singularities. The Fuchsian algorithm, which is developed by Kichenassamy and Rendall, is used. The square of Riemann curvature blows up in the case. Into the future direction, it is proved that the spacetimes are future geodesically complete. Thus, the validity of SCCC is shown.