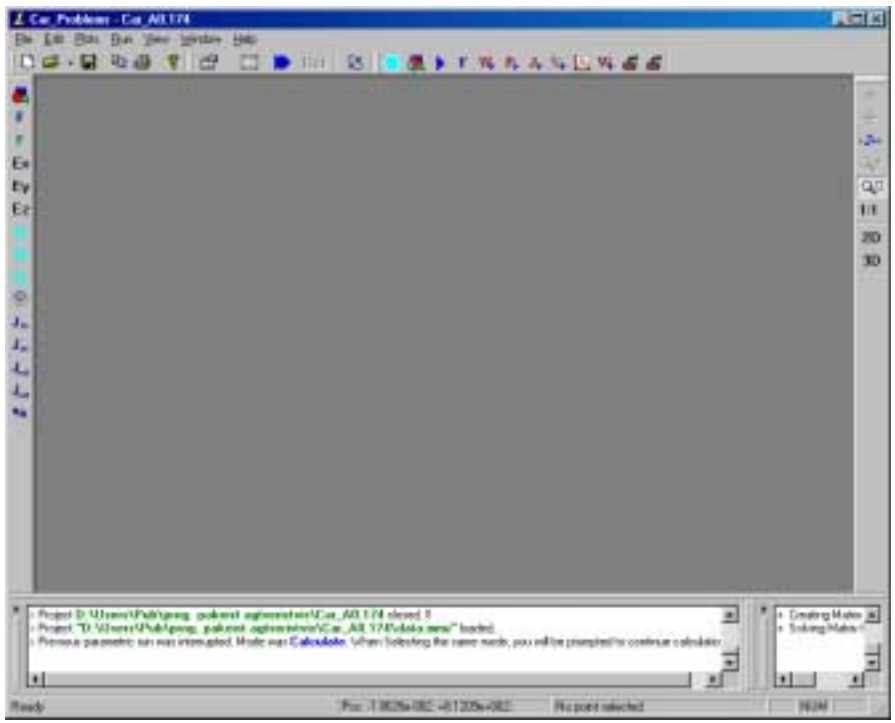
Software Package "Car-Problem Solver"

To study electrodynamic properties of complex metallic objects the conduct of numerical experiment is preferable to the real experiment as the latter is associated with considerable expenses. The software package "Car-Problem" enables replacement of the real experiment with the numerical one. Moreover, it makes the analysis of obtained results substantially easier and gives the opportunity to observe and even control the physical processes that take place in the system.

Interface of the "Car-Problem Solver" is shown on figure. The software package is built in compliance with the established standards and requires minimal computer literacy. Also, the user does not need a deep knowledge of the method or the mathematical apparatus used for the solution of the problem. The software enables conducting of the experiment multiple times to investigate system's electromagnetic properties and formulate specific recommendations.



The program package operates with **Widows 95/98/NT/2000**. Its minimal requirements are: A personal computer with ***Pentium III*** **processor**, **512 MGb RAM**.
To process and conduct numerical calculations for each static variable, **Pentium III/800MHz** requires approximately **5** minutes. In total, the study of antenna characteristics for one particular parameter takes about **10** hours.

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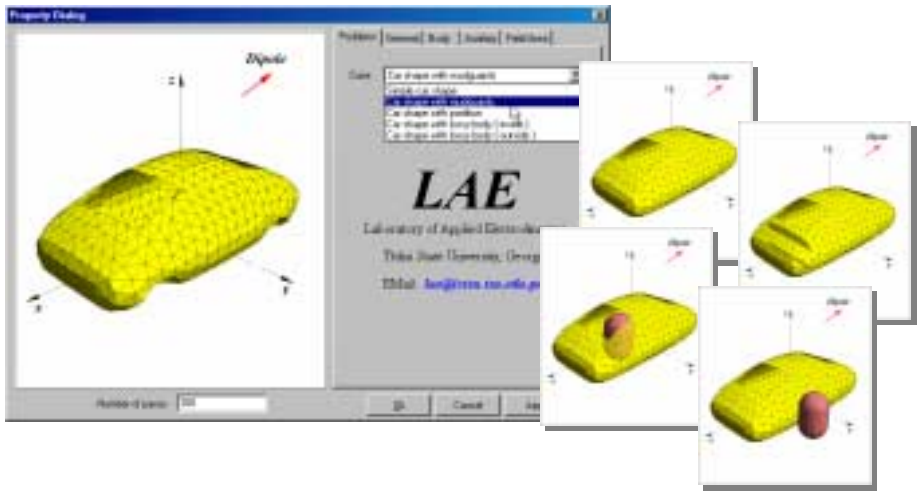
Parameters Dialogue Boxes

A special dialogue box shown on fig. 3.11 enables the user to vary the parameters of the system. In this dialogue mode one can choose

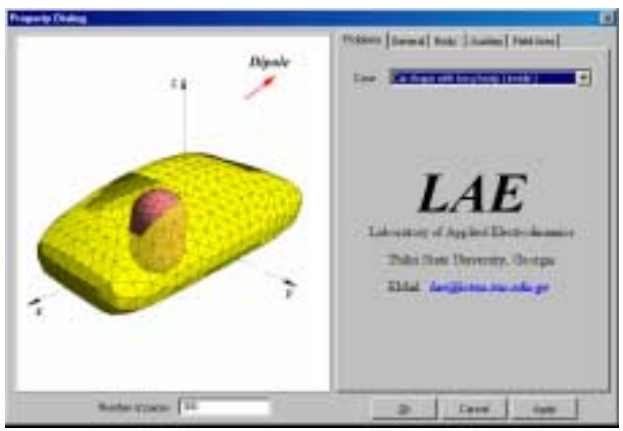
- The simplified model of the car;
- The car model including the tires;
- The car model including partitions;
- Model including the passenger inside or outside the car.

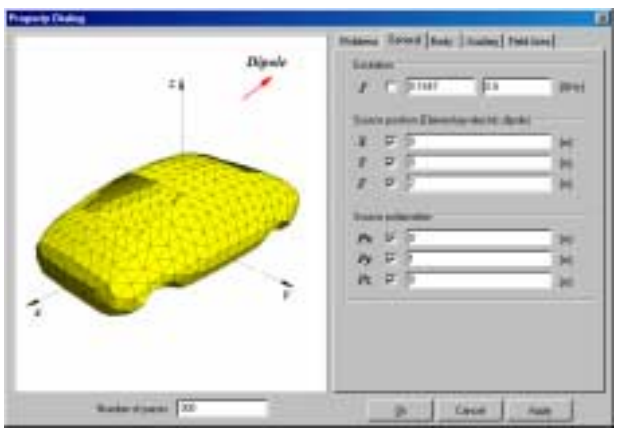


Next, the user can vary:

- The type of excitation source, its location and frequency of the incident field; Observation area of the diffraction field;
- Position of the user; Geometric and electromagnetic parameters of the user (As the model of the user an absorbent dielectric cylinder was chosen).

In the above-mentioned dialogue box it's also possible to change one or more parameters of the system in a dynamic mode in order to observe the behavior of radiation characteristics of an antenna with respect to the parameter varied.





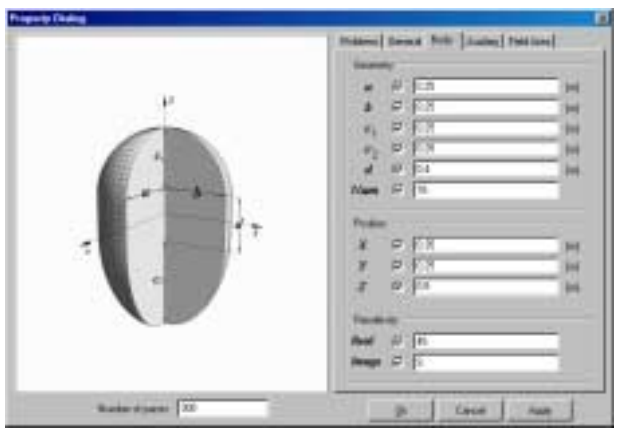


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Figure below shows the software package during one of the numerical experiments. It enables studying of electrodynamic properties of the system to achieve electromagnetic compatibility.

Within the framework of this software, investigation of totally different structures is also possible. One may also use this package as a demonstration tool for educational purposes. The software enables students and novice scientists to observe physical processes and analyze obtained results in the real time span. With the help of the presented program package one can control the accuracy of the solution and visualize:

- distribution of the near field;
- field diagrams in the far zone
- resonance graphs received as a result of parametric calculations;
- energy characteristics;
- distribution of currents etc.