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Պողոսյան Հասմիկ Ռուբիկի

ԴՈՒԱԼՈՒԹՅՈՒՆՆԵՐ և ԴԵՖԵԿՏՆԵՐ

Ա.04.02-<<Տեսական Ֆիզիկա>>մասնագիտությամբ
ֆիզիկամաթեմատիկական գիտությունների թեկնածուի գիտական
աստիճանի հայցման ատենախոսության

ՍԵՂՄԱԳԻՐ

ԵՐԵՎԱՆ – 2017

A. I. ALIKHANIAN NATIONAL SCIENCE LABORATORY

Hasmik Poghosyan

DUALITIES AND DEFECTS

SYNOPSIS

of Dissertation in 01.04.02-Theoretical Physics presented for the
degree of candidate in physical and mathematical sciences

YEREVAN-2017

Ատենախոսության թեման հաստատվել է Ա. Ի. Ալիխանյանի անվան Ազգային գիտական լաբորատորիայի (ԵրՖի) գիտական խորհրդում:

Գիտական ղեկավար՝ Ֆիզմաթ. գիտ. դոկտոր Սարգսյան Գոռ (ԵՊՀ, ԵրՖի)

Պաշտոնական ընդդիմախոսներ՝

Ֆ.մ.գ.դ Գ. Ջորջաձե (ԹՊՀ, Թիբիլիսի, Վրաստան)

Ֆիզմաթ. գիտ. Դոկտոր Ն. Իզմաիլյան (ԵրՖի)

Առաջատար կազմակերպություն՝ Երևանի Պետական Համալսարան

Պաշտպանությունը կայանալու է 2017 թ. նոյեմբերի 14-ին ժամը 14-ին, ԱԱԳԼ-ում գործող ԲՈՀ-ի 024 <<Միջուկի և տարրական մասնիկների ֆիզիկա>> մասնագիտական խորհրդում (Երևան-36, Ալիխանյան եղբ. փ. 2)
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Մասնագիտական խորհրդի գիտական քարտուղար՝

Ֆիզմաթ. գիտ. դոկտոր Դ. Ռ. Կարախանյան

The subject of the dissertation is approved by the scientific council of the A.I. Alikhanian National Science Laboratory (YerPhi)
Scientific adviser: d .ph-math. sci. Gor Sarkissian (YSU,YerPhi)
Official Opponents: d. ph-math. sci. G. Jorjadze (TSU, Tbilisi, Georgia)
d. ph-math. sci. N. Izmailian (YerPhi)
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The Dissertation can be learnt at the ANSL library.
The synopsis is sent out on 13th October 2017.
Scientific secretary of the special council
Doctor of the physical and mathematical sciences Karakhanian D.R.

Abstract

This work is devoted to the study of interfaces and semi-classical limits of conformal blocks in different types of two-dimensional conformal field theories (CFTs),

Conformal interfaces (or defects) between two CFTs related by an RG (renormalization group) flow are referred as RG domain wall. They give an exact relation between the operators in the UV (ultraviolet) and IR (infrared) CFTs. We explicitly constructed the RG domain wall between two minimal N=1 SCFT models SM_p and SM_{p-2} related by the RG flow initiated by the top component of the Neveu-Schwarz super-field $\Phi_{1,3}$. This allowed us to calculate the mixing coefficients for several classes of fields and to match them with the ones obtained through the perturbative analysis.

Topological defects are the special class of the conformal interfaces for which the energy-momentum tensor is continuous across the defect. We analyzed the Lagrangian of the Liouville theory with topological defects and found the general solution of its equations of motion. Using these solutions, we were able to investigate the heavy and light semi-classical limits of the defect two-point function found before via the bootstrap relations.

For the N = 1 super Liouville theory (SLFT) we solved the Cardy-Lewellen equation for defects. To find the solutions we generalized some expressions (relating certain elements of the fusion matrix to the structure constants) valid in rational conformal field theory to the N=1 SLFT.

The AGT correspondence connects the Nekrasov Partition Function in four dimensional N=2 supersymmetric Yang-Mills (SYM) theory to the Liouville conformal blocks in two dimensions. It is known that the Nekrasov Partition Function can be presented as a sum over Young diagrams. We showed that for certain class of CFT blocks the corresponding Nekrasov partition functions in the light asymptotic limit are simplified drastically namely being represented as a sum of a restricted class of Young diagrams. This allowed as to compute the light asymptotic limit of A_{n-1} Toda conformal blocks.

There is a AGT like duality between SU(2) N=2 super-symmetric field theories living on R^4/Z_2 space and N=1 SLFT. We showed that again only a restricted set of Young diagrams contribute to the partition

function in the light asymptotic limit. This enabled us to sum up the instanton series explicitly and find closed expressions for the corresponding N=1 SLFT four point blocks in the light asymptotic limit.

Timeliness and relevance

Two dimensional conformal field theories play an important role in modern-day theoretical physics. These are two dimensional quantum field theories that are invariant under conformal transformations [3].

Conformal symmetry was introduced in quantum field theory nearly fifty years ago under the influence of ideas of scaling and universality in theories of the second-order phase transitions [1]. According to the scaling postulate at the critical point the interaction of fields corresponding to the order parameters of the statistical system becomes scale invariant.

If a theory is endowed with scale invariance, then its energy-momentum tensor is traceless. This kind of theories are also invariant with respect to a larger class of coordinate transformations under which the metric tensor gets multiplied by an arbitrary function. Such coordinate transformations form the conformal group [3].

The properties of the conformal group in d>2 differ from those of d=2 (d is the space-time dimension). In the first case the conformal group is finite and consists of translations, rotations, dilatations, and special conformal transformations [2], while in the second case it is infinite-dimensional and consists of holomorphic and anti-holomorphic transformations.

The Laurent series coefficients of the stress energy tensor are the generators of the conformal group. The algebra of these generators coincides with the central extension of the Witt algebra and is known as the Virasoro algebra. The value of the central charge is an important parameter that characterizes the theory and can be considered as the effective degree of freedom of the system.

There are certain fields in the operator algebra such that all the other fields can be constructed from these special fields by applying conformal transformations. The first ones are called primary fields, while the others descendants or secondary fields.

The correlation functions of the secondary fields can be obtained by applying special differential operators on the correlation functions of the corresponding primary fields. This is why all the information about conformal field theory is encoded in the correlation functions of the primary fields.

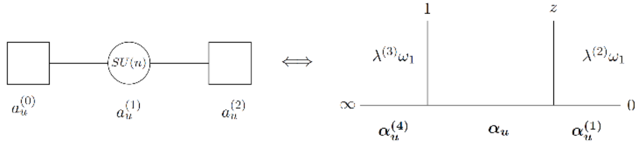
An important example of CFT is Liouville field theory [4,5] which is a bosonic field theory with an exponential interaction. This theory is endowed with spin two conserved currents that are the holomorphic and anti-holomorphic components of the stress energy tensor. The Fourier components of these currents obey the Virasoro algebra. It turns out that there are more general CFTs which in addition to the spin two currents include also conserved currents with higher spins [5]. The corresponding symmetry algebra is called W algebra. Important examples of theories that have W symmetry proportions are Toda theories. These theories generalize LFT for the cases of several interacting scalar fields.

As a first step on the way of constructing of a full-fledged quantum Theory it is always instructive to investigate its semi classical limit.

In both Liouville and Toda theories one can distinguish three types of semi classical limits: these are mini-superspace, heavy and light limits. All three are the large central charge limits and they differ from each other by the behavior of primary fields under consideration.

The AGT correspondence [6] connects two-dimensional conformal blocks to the Nekrasov partition function [7-9] of the four-dimensional N = 2 Supersymmetric gauge theories. It is a powerful tool not only for deriving correlation functions in two-dimensional CFTs but also for studying gauge theories by applying CFT methods. The Nekrasov partition function can be represented as a sum over Young diagrams [7-9] which according to AGT correspondence can be used to compute conformal blocks in two dimensional CFTs.

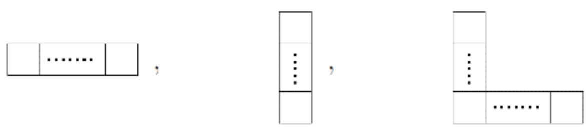
We have considered the U(N) Nekrasov partition function in the light asymptotic limit i.e. we connected the gauge parameters with the CFT parameters (the conformal dimensions) in the light limit schematically.



We proved that in this limit for a specific choice of fields in the Nekrasov partition function contribut only certain kinds of Young diagrams. This simplification was so strong that it was possible to write an explicit formula for the partition function with arbitrary N. After applying AGT we got the W_N light conformal blocks for arbitrary N-'s.

It was known that there exists a AGT like correspondence also between the two-dimensional super-symmetric CFT and a certain four-dimensional gauge theory.

In [10,11] the Nekrasov U(N) partition function analog on R^4/Z_N space was constructed. Furthermore, a map between the U(2) gauge theory partition function on R^4/Z_2 and the four point Neveu–Schwarz correlation function in two dimensional N=1 super conformal field theory (SCFT) [13-17] was suggested in [12]. It was natural that in this case too we were able to show that in the light asymptotic limit only a restricted set of Young diagrams contribute (i.e. one row diagrams) to the partition function so that it was possible to sum up the instanton series explicitly. Then we performed the analog of the AGT map and got the light conformal blocks in the Neveu–Schwarz sector. In two dimensional N =1 SCFTs in addition to the Neveu–Schwarz fields one has also the Ramond fields. In [18] the analogue of the AGT map for the correlators containing two Ramond and two Neveu–Schwarz fields, as well as for those of four Ramond fields, was suggested. Again, it was reasonable that we were able to find exact expressions for these conformal blocks in the light asymptotic limit. Let me stress that in the Ramond sector not only one row diagrams contribute but also diagrams like:



A. Zamolodchikov in one of his well-known papers [19] investigated the RG flow from minimal model M_p to M_{p-1} initiated by the relevant field $\varphi_{1,3}$. The operators in M_p are mixed and renormalized to give operators in

M_{p-1}. He calculated the mixing coefficients for several classes of local fields by using leading order perturbation theory valid for the large p. There exists a similar RG trajectory connecting N=1 super-minimal models SM_p to SM_{p-2} initiated by the NS top component $\Phi_{1,3}$. Oriented lines separating two different two-dimensional quantum field theories are called interfaces or defects. Conformal interfaces satisfy the gluing condition $T^{(1)} - \bar{T}^{(1)} = T^{(2)} - \bar{T}^{(2)}$. An interface can be regarded also as a map between observables in two theories. An example of a conformal interface is the RG domain wall which relates the operators between UV and IR theories [20]. Gaiotto proposed an algebraic construction for coset minimal models and also for N=1 coset super-minimal models. One of the advantage of this RG domain walls is that it enables us to derive the mixing coefficients of operators under RG flow without making use of known perturbation methods. Topological defects are special type of conformal interfaces for which $T^{(1)} = T^{(2)}$ and $\bar{T}^{(1)} = \bar{T}^{(2)}$. Topological defects in 2d CFT can be considered as an operator D which commutes with the generators of both left and right chiral algebras of the CFT. This condition ensures that the operator D is invariant under the distortion of the line to which it is attached. Topological defects in the Liouville field theory play an important role in the AGT duality with Wilson lines. We studied various aspects of the topological defects in the Liouville and super-Liouville field theories.

Aim of the dissertation

- the derivation of conformal blocks in the light asymptotic limit for A_{n-1} Toda theories,
- the derivation of conformal blocks in the light asymptotic limit for N=1 SLFT,
- the study of topological defects in the Liouville and N=1 super Liouville field theories,

- to construct conformal interface between SM_p and SM_{p-2} N=1 SCFT models.

Novelty of the work

In this work the following new results were obtained:

1. We found analytic expressions for A_{n-1} Toda conformal blocks in the light asymptotic limit, for arbitrary n, applying the AGT correspondence and using the Nekrasov partition functions.
2. We found N = 1 SLFT conformal blocks in the light asymptotic limit in the NS and R sectors by applying the AGT like duality and compared the results with the corresponding formulae found with the direct CFT methods in the NS sector.
3. We established for N = 1 super Liouville field theory Moore-Seiberg relations between the fusion matrix and the structure constants.
4. We found topological defects for N = 1 super Liouville field theory.
5. We studied semi classical properties of the topological defects in the Liouville theory.
6. We calculated explicitly the mixing coefficients for the several classes of local fields in the case of the supersymmetric RG flow by using Gaiotto's proposal for the RG domain wall between some coset CFT models.

Practical value

Defects and interfaces play important role for the various problems in condensed matter, String theory, Ads/CFT and AGT correspondences.
Our findings can find an application in all these topics.
The technique developed in this thesis for calculation of conformal blocks in semi-classical limit can be used in numerous other problems. In particular, we can compute semi-classical limit of conformal blocks in

the para Liouville and para Toda field theories describing the interaction with parafermions. These limits occur in testing of the Ads/CFT correspondence.

Main points to defend

Main points to defend are:

1. We found that Nekrasov partition functions corresponding to A_{n-1} Toda conformal blocks for the certain choice of fields in the light asymptotic limit are simplified drastically and given by the sum over Young diagrams having at most n-1 rows.
2. We found that to the Nekrasov partition functions corresponding to $N = 1$ SLFT conformal blocks in the light asymptotic limit contribute only Young diagrams having one raw and one column.
3. For $N = 1$ super Liouville field theory we have shown that certain elements of the fusion matrix in the NS sector are related to the structure constants according to the same rules which one observes in RCFTs (rational conformal field theories). For some special cases we showed that certain elements of the fusion matrix in the R sector are related to the structure constants according to the same rules which we observe in the NS sector. Using these relations in the R sector we were able to solve the Cardy-Lewellen equations for topological defects.
4. For the Lagrangian of the Liouville theory with topological defects we found the general solutions of the corresponding defect equations of motion. Then we calculated the defect two-point functions in the light and heavy asymptotic limits.
5. We specified Gaiotto's proposal for the RG domain wall between some coset CFT models to the case of two minimal $N=1$ SCFT models SM_p and SM_{p-2} related by the RG flow

initiated by the top component of the Neveu-Schwarz superfield $\Phi_{1,3}$. We then compared the result to the perturbation theory results available in the literature and found that they are in perfect agreement.

Length and structure of the dissertation

The dissertation contains an Introduction, 6 chapters and the bibliography. The first chapter is a review of the necessary CFT tools. The other chapters describe our findings.

Content of the dissertation

In chapter 1 we review the material necessary to present our findings. In chapters 2-6 we explain the background of the solved problem and deliver the findings.

Chapter 1

We define what the d-dimensional conformal transformations are. Then we concentrate on the case when d=2. We show that the generators of two-dimensional conformal transformations obey the so called Witt algebra. We demonstrate that the conformal invariance forces the energy momentum tensor to be traceless. We consider radial quantization, OPE of operators. After that we argue that the OPE of the energy momentum tensor with itself must have a central extension term, which is equivalent to the statement that in CFT the modes of the energy momentum tensor obey the Virasoro algebra. We show that conformal invariance fixes the two- and three-point functions up to constant factor known as structure constants. We end this chapter by exhibiting that the Hilbert state is the direct sum over the product of holomorphic and anti-holomorphic Verma modules.

Chapter 2

We review Minimal models which are the simplest of all of CFTs. In these theories the number of primary fields is finite. After that we briefly explain the basics of coset theories. The next sections are based on the paper [5] in my publication list. Namely:

- we briefly review the 2d N = 1 super-conformal filed theories;
- we bring the description of the coset construction of N = 1 SCFT;
- we formulate Gaiotto's general proposal for a class of coset CFT models;
- we present the new results which we obtained in the paper [5], where we explicitly calculated the mixing coefficients for the several classes of local fields in the case of the supersymmetric RG flow, by using RG domain wall proposal. Then we compared this with the perturbation theory results available in the literature and found a complete agreement.

Chapter 3

This chapter we begin by introducing the reader to the so called Liouville field theory. In this theory the number of primary fields is infinite, which is to say that the theory is irrational. The next sections of this chapter contain the materials presented in the papers [4,6] in my publication list, namely:

- we analyze classical Liouville theory with defects;
- we review the general solution of the Liouville equation;
- we present general solution of the defect equations of motion;
- we present the Lagrangian of the product of the Liouville theories on half-plane with the boundary condition specified by a permutation brane;
- we review defects and permutation branes in quantum Liouville theory;
- we review the heavy and light asymptotic semi-classical limits,

- we calculated the defect two-point function in the light asymptotic limit, and showed that it is given by the path integral over solutions of the defect equations of motion with vanishing energy-momentum tensor;
- we calculated the defect two-point function in the heavy asymptotic limit and showed that it is given by the exponential of the Liouville action with defect evaluated on the solution with two singular points.

Chapter 4

As we have mentioned already the tree-point function is fixed by conformal symetry up to a constant factor known as structure constants. The structure constants are parameters of the theory under consideration. They can be found by the so called bootstrap procedure. In this chapter we review the bootstrap procedure, the remaining sections contain the material from the paper [3] in my publication list:

- we review basic facts on N = 1 super-Liouville theory;
- we compute the elements of an ansatz for the fusion matrices with one of the intermediate states set to the vacuum;
- we specialize the formulae obtained in the previous paragraph to the component of the fusion matrices of the NS sector;
- we analyze the Ramond sector for a degenerate entry;
- we apply formulae obtained in the previous paragraph to solve the Cardy-Lewellen equations for the topological defects.

Chapter 5

We review the basic facts of Toda CFT, which are 2d CFT theories that besides the spin 2 holomorphic energy momentum current are endowed with the additional higher spin currents. After that, anticipating the AGT correspondence we review instantons and so called Nekrasov's partition functions in four-dimensional N=2 Super Yang-Mills gauge theory. The later chapters will connect the Nekrasov partition functions to the Toda conformal blocks by the so called AGT correspondence. The following sections contain the results from the paper [2] in my publication list. They are organized in the following way:

- we review necessary details on the light asymptotic limit;
- we compute the light asymptotic limit of the Nekrasov partition functions, and show that choosing the data in a certain way truncates the Nekrasov functions in the light asymptotic limit to the sum over Young diagrams containing at most $n - 1$ rows;
- we compute the Nekrasov partition function in the light asymptotic limit. This allows us to obtain the A_{n-1} Toda four point functions in the light limit, where $n>1$;
- we compute the conformal block in A_2 Toda field theory by using the fact that in the light asymptotic limit conformal blocks admit an integral representation. We compare this result and the formula obtained by the AGT correspondence and show that they are the same.

Chapter 6

This chapter contains the results obtained in the paper [1] in my publication list. It is organized as follows:

- the expression for the instanton partition functions of $N = 2$ SYM on R^4/Z_2 is reviewed;
- we bring known facts for $N = 1$ SLFT and its light asymptotic limit that will be useful for us;
- the map between $N = 1$ super Liouville conformal blocks and $N = 2$ SYM on R^4/Z_2 is given;
- the rules for the light asymptotic limit are written;
- we present new results on various partition function in the light limit;
- by using these partition functions, we give the corresponding conformal blocks in the light limit.

Conclusions

We were able to derive the conformal blocks in the light limit for two generalizations of Liouville theory. Namely for its higher integer spin generalization A_{n-1} Toda and for the spine 3/2 generalization N=1 super-Liouville field theory.

We analyzed topological defects for LFT in its light and heavy limits. We solved the Cardy-Lewellen equations for a topological defect in N=1 SLFT.

We explicitly derived the mixing coefficients of several classes of fields under the RG flow from the N=1 super minimal model M_p to M_{p-2} initiated by the relevant NS field $\Phi_{1,3}$.

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1. Hasmik Poghosyan, The light asymptotic limit of conformal blocks in N = 1 super Liouville field theory, JHEP: 09(2017)062, arXiv:1706.07474.

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ԴՈՒԱԼՈՒԹՅՈՒՆՆԵՐ և ԴԵՖԵԿՏՆԵՐ

Ամփոփում

Երկչափ Կոնֆորմ Դաշտի Տեսությունները (ԿԴՏ) քվանտային դաշտի տեսություններ են, որոնք սահմանված են երկչափ տարածություն-ժամանակում և ինվարիանտ են կոնֆորմ ձևափոխությունների նկատմամբ։ Էներգիա-իմպուլսի թենզորի կոմպոնենտները հանդիսանում են կոնֆորմ խմբի գեներատորները, որոնց Ֆուրյե գործակիցները բավարարում են Վիրասորոյի հանրահաշվին։ ԿԴՏ-ի կարևոր օրինակ է Լիուվիլի Դաշտի Տեսությունը (ԼԴՏ), որը էքսպոնենտային օրենքով փոխազդող բոզոնային դաշտի տեսություն է։ Կան Նաև ավելի ընդհանուր ԿԴՏ-ներ, որոնք բացի երկու սպինով հոսանքներից (Էներգիա-իմպուլսի թենզորի հոլոմրֆիկ և անտիհոլոմորֆիկ կոմպոնենտներ) պարունակում են նաև ավելի մեծ սպինով պահպանվող հոսանքներ։ Համապատասխան սիմետրիայի հանրահաշիվը անվանում են W հանրահաշիվ։ W համաչափությամբ օժտված տեսության կարևոր օրինակներ են Թոդայի տեսությունները, որոնք ընդհանրացնում են Լիուվիլի տեսությունը մի քանի փոխազդող սկալյար դաշտերի համար։Լիուվիլի, ինչպես նաև Թոդա տեսության մեջ կարելի է տարբերակել երեք տեսակի քվազիդասական սահմաններ՝ մինի սուպեր-տարածություն, ծանր և թեթև սահմանները։

Թվենք դիսերտացիայում ներկայացված հիմնական արդյունքները

- Ստացել ենք Wn տեսության կոնֆորմ բլոկերը կամայական n-ի համար թեթև քվազիդասական սահմանում:
- Թե՛Նևյու-Շվարցի և թե Ռամոնյան սեկտորներում գտել ենք անալիտիկ արտահայտություններ երկչափ N=1 Սուպերսիմտրիկ կոնֆորմ բլոկերի համար, թեթև քվազիդասական սահմանում:
- Մանրամասն ուսումնասիրվել է դեֆեկտով ԼԴՏ-ի լագրանժանը, գտնվել է համապատասխան շարժման հավասարումների ընդհանուր լուծումը: Ուսումնասիրվել են երկու կետանի ֆունկցիայի ծանր և թեթև քվազիդասական սահմանները:
- N=1 սուպեր ԿԴՏ-ում ցույց ենք տվել, որ միաձուլման մատրիցի որոշակի էլեմենտներ Նևյու-Շվարցի սեկտորում կապված են կառուցվածքային գործակիցների հետ նույն կանոններով, որոնք դիտվել են ռացիոնալ ԿԴՏ-ում: Բերել ենք փաստարկներ, որ այդ արտահայտությունները ճիշտ են նաև Ռամոնյան սեկտորում: Օգտվելով այդ առնչություններից ուսումնասիրել ենք Քարդի-Լյուվելենի պայմանը դեֆեկտների համար:
- Գայոտոն կանխագուշակել է RG դոմեյն պատը որոշ կոսետ ԿԴՏ-ների համար: Մենք ուսումնասիրել ենք դրա մասնավոր դեպքը՝ մինիմալ N=1 սուպեր ԿԴՏ մոդելներում: Դաշտերի մի քանի դասերի համար բացահայտորեն հաշվել ենք խառնվելու գործակիցները:

ДУАЛЬНОСТЬ И ДЕФЕКТЫ

Резюме

Двумерные конформные теории поля (КТП) это квантовые теории поля которые определены в двумерном пространстве-времени и инвариантны относительно конформных преобразований. Компоненты тензора энергии-импульса являются генераторами конформной группы а их коэффициенты Фурье удовлетворяют алгебре Вирасоро. Важным примером КТП является теория поля Лиувилля (ЛТП), которая является теорией бозонного поля с экспоненциальным взаимодействием. Существуют более общие КТП, которые помимо токов со спином два включают также сохраняющиеся токи с более высокими спинами. Соответствующая алгебра симметрии называется W-алгеброй. Важными примером теорий, обладающих W-симметрией, являются теории Тода. Эти теории обобщают ЛТП для случая нескольких взаимодействующих скалярных полей. В теориях Лиувилля и Тоды можно выделить три типа квазиклассических пределов, это мини-суперспейс, тяжелые и легкие пределы.

Основные результаты, представленные в диссертации:

- Мы получили явные аналитические выражения для A_nToda конформных блоков в легком асимптотическом пределе, для произвольного n.
- Мы также нашли явные аналитические выражения для двумерных N = 1 суперсимметричных конформных блоков в легком асимптотическом пределе как в Неве-Шварцовском так и в Рамоновском секторах.

- Мы проанализировали лагранжиан LFT с топологическими дефектами и нашли общее решение соответствующих дефектных уравнений движения. Мы изучили тяжелые и легкие квазиклассические пределы двухточечной функции при наличии топологических дефектов, которая была найдена ранее из соотношений бутстрапа.
- Для N = 1 суперсимметричной теории супер-Лиувилля мы показали, что некоторые элементы матрицы слияния в секторе Неве-Шварца связаны со структурными константами по тем же правилам, которые были установлены в рациональной конформной теории поля. Мы собрали некоторые свидетельства того, что эти соотношения должны выполняться также в Рамоновском секторе. Используя их, мы получили уравнение Карди-Льювеллена для дефектов и построили дефекты в N=1 суперсимметричной теории Лиувилля .
- Мы изучили предположение Гайотто о существовании ренормгруппового конформного интерфейса между определенными косет CFT-моделями для частного случая двух минимальных N = 1 SCFT-моделей SM_p и SM_{p-2}, связанных ренормгрупповым потоком, индуцированным верхней компонентой Неве-Шварцовского суперполя $\Phi_{1,3}$.